Columbia University in the City of New York

PRESIDENT'S ANNUAL REPORT

1898

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NINTH
ANNUAL REPORT
OF
PRESIDENT LOW
TO THE
TRUSTEES

OCTOBER 3, 1898

NEW YORK
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1898

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To the Trustees of Columbia College in the City of New York:

I have the honor to submit herewith my annual report for the academic year ending June 30, 1898.

Toward the end of the year, on June 4, 1898, just as the exercises of Commencement week were about to begin, the University met with a heavy loss by the death of Stephen P. Nash, who had been a Trustee of the University for thirty years. Mr. Nash became a Trustee in 1868, and thereafter, until the day of his death, was constant and unfailing in his devotion to the interests of the University. His carefulness, his good judgment, his acquaintance with the law, his willingness to give valuable time, and his gentle courtesy, combined to make him at all times one of the most influential members of the Board. Mr. Nash was not an alumnus of Columbia, but no son ever served his Alma Mater more faithfully and lovingly than did Mr. Nash the University which had honored him by making him one of its board of control. The University gratefully adopted him into the ranks of its own sons by conferring upon him in 1889 the honorary degree of Doctor of Laws. At his death, it named in his honor one of its chairs of law, the Nash Professorship of Law.

The venerable and beloved Henry Drisler died, full of years and of honors, November 30, 1897. As student or as officer, the name of Henry Drisler had been borne upon the books of Columbia College since 1835. After fifty years of service as a professor, he was retired from active duty, at his own request, in June, 1894. During this long period, Dr. Drisler had held successively the chair of Latin and the chair of Greek, and twice he had served as Acting President. No other figure in our history has been so long and so completely identified with Columbia. His work as a lexicographer made his name well known to all classical students; and his exact scholarship added to the just renown of his Alma Mater. His relations with Columbia were characterized by a mutual love. He loved unaffectedly the College and everything connected with it ; and the College and all who bore its name returned this affection with sincere esteem and regard.

Prof. Charles Edwards Colby, Adjunct Professor of Organic Chemistry, died on October 15, 1897. Graduating from the School of Mines in 1877 with the two degrees of Civil Engineer and Mining Engineer, he spent his life in the Department of Chemistry under Prof. Chandler. He was distinctly a man of ability in his profession, but he never enjoyed robust health. Struggling constantly against his infirmities, he died at his post, faithful to the end.

Edwin M. Kitchel, M.D., an Assistant in Normal Histology in the Medical School, died on August 26, 1897, as the result of an accident. Dr. Kitchel was a graduate of the College of Physicians and Surgeons in 1893. His career, short as it was, had given promise of success in his chosen field.

THE NEW HOME

On the 4th of October, 1897, the University formally began its work of education in the new buildings which have been in course of preparation for it, since the purchase of the site on Morningside Heights in March, 1892. The ceremony of taking possession was as simple as possible. The usual chapel service was held in the reading-room of the Library, thus consecrating the University, at its very heart, in the service of God, to the service of man in the discovery and dissemination of truth. At the close of the service the President welcomed the officers and students of the University to the new home, after which the daily routine of the academic year immediately began. It is a pleasure to be able to say, after a year's use, that it is evident no serious mistake has been made in the planning and equipment of the buildings. They are well adapted for the work to be done in them, and the beauty and dignity of the development as a whole give inspiration to teacher and student alike. This is the universal testimony.

A pleasant feature of the year has been the series of house-warmings given by the occupants of the various buildings. These occasions, known as Columbia University Teas, began with a reception in the Library on the 8th of January, 1898. This was followed by teas, in Schermerhorn Hall, on January 22d ; in Havemeyer Hall, on February 5th, which chanced, by a happy coincidence, to be the birthday of Frederick Christian Havemeyer, in whose memory Havemeyer Hall was erected ; in Barnard College, on March 12th ; and in Fayerweather Hall and the Engineering Building, on April 16th. On February

19th Teachers College gave a reception to President and Mrs. Low in celebration of the union of the College with Columbia University. Thus many thousand people became acquainted, during the year, with the unusual educational equipment that now exists upon Morningside Heights. When, on Commencement Day, June 8th, twenty classes held class meetings upon the grounds, and several thousands of the friends of the graduating students took part in the first Commencement that Columbia University ever held upon its own grounds, something of what it means to such an institution to be suitably housed was borne in upon everyone, and all rejoiced that Columbia should be able at last to occupy a home of its own so worthy, at once, of the city and of the high things for which the University stands.

With the completion of the initial improvements at the new site, the Trustees have taken action to redeem their pledge that they would preserve in some appropriate manner the names of all who have been benefactors of the University in any marked way. In view of the fact that the University has received from the will of the late Daniel B. Fayerweather, that generous benefactor of many colleges, the sum of about $300,000, the Trustees have given the name of Fayerweather Hall to the building which has been erected for the use of the Department of Physics. In other cases, arrangements have been made to recognize the fact of the gift and the name of the donor upon tablets to be appropriately placed in the various buildings. Such tablets, with the passage of time, acquire an historic value, and at all times they add interest to the buildings in which they are. It is hoped, also, that the names of many of the donors will be attached to scholarships. Already four scholarships in the College have been named the Hewitt Scholarships and the Harper Scholarships after Abram S. Hewitt and the late Joseph W. Harper. They are available, one each year during the College course, for graduates of the New York City high schools.

The process of gradually completing the ornamentation of the Library Building has been most generously begun, during the year, by the gift of four statues reproduced from ancient models by Mr. Daniel C. French. These statues have been placed above the four pillars on the northern side of the reading-room of the Library. The subjects are: Euripides, presented by Mr. Charles F. McKim; Sophocles, by Dr. George G. Wheelock; Demosthenes, by Mr. W. Bayard Cutting; and Augustus Cæsar, by Mr. F. Augustus Schermerhorn. The building lends itself happily to ornamentation of this kind, and it is hoped that, through the gifts of friends and with the memorials of classes, the building will grow in interest and beauty from year to year. It is by additions like these, which the years bring, that the life inhabiting these buildings will give to them before long the unmistakable stamp of its own individuality.

The Trustees have established a Committee on Art, consisting of Mr. Charles F. McKim, the architect whose firm designed the buildings, Mr. Edwin H. Blashfield, the artist, and Mr. Daniel C. French, the sculptor, whose advice and counsel it is proposed to take in all matters coming within the province of such a committee. These gentlemen have generously agreed to give their services without compensation.

PATRIOTIC MEMORIALS

On the afternoon of Saturday, October 16, 1897, the Sons of the Revolution presented to the University a tablet commemorative of the Battle of Harlem Heights. This tablet has been placed, with the consent of the Trustees, upon the Engineering Building on the Boulevard side. The tablet, recalling, as it does, the death of Colonel Knowlton and Major Leitch and of other patriots in the Revolutionary engagement fought upon this spot, vividly reminds all who pass by that the nation was born, as it still lives, in the self-sacrifice of its sons. This memorial ties our new home to the historic past by a most inspiring bond. Upon land so consecrated, and in sight of the people's monument to General Grant, the patriotic spirit which has always been characteristic of Columbia cannot but flourish in the future as in the past.

Within the grounds of the University, additional impulse to the growth of the same spirit is given by the beautiful flag-staff which was presented to the University by Lafayette Post of the Grand Army of the Republic on the afternoon of the 7th of May, 1898, in fulfilment of the promise made by the Post at the dedication of the site on the 2d of May, 1896. Gen. Daniel Butterfield, as Commander of Lafayette Post, in the presence of the Post and of the Trustees and Officers and Students of the University, presented the staff, with the usual impressive ceremonies of the Grand Army of the Republic. The President, on behalf of the University, accepted the gift as a sacred trust, promising that the country's flag should always fly from this staff, and renewing for the men of Columbia the pledge already made on their behalf that they would at all times love, cherish, and defend the flag and all for which it stands. The flag-staff is a noble stick of Oregon pine, 90 feet high, set in bronze in a base of granite. The base bears the following inscriptions, in letters of bronze:

East	PRESENTED TO COLUMBIA UNIVERSITY BY LAFAYETTE POST NO. 140 DEPT. OF N. Y. GRAND ARMY OF THE REPUBLIC
West	ANNO DOMINI MDCCCXCVI
North	LOVE CHERISH DEFEND IT
South	BADGE OF THE G. A. R.

THE WAR WITH SPAIN

Owing to the outbreak of the war with Spain, on the 21st of April, 1898, the work of the University in the closing weeks of the year was somewhat interrupted by the departure for the war both of officers and students. At the personal request of the President of the United States, Prof. John B. Moore, Hamilton Fish Professor of International Law and Diplomacy, was given a leave of absence to accept the position of First Assistant Secretary of State at Washington.

The Chaplain of the University, Rev. George R.

Van De Water, D.D., went to the front, on leave, as Chaplain of the 71st Regiment of N. Y. Volunteers. In camp and on the field, Dr. Van De Water was always ready for duty; alike by the sick-bed and under fire, he ministered consolation to the sick and wounded; and more than one brave lad he committed to the ground with Christian burial. He will return in the autumn, to his post as Chaplain of the University, enriched by dearly bought experience, to be sure, but better equipped than ever for the work that he does here among the students. Always a favorite, he will be admired and loved more than ever.

Adjunct Professor Charles E. Pellew, of the Department of Chemistry, enlisted with others of his fellows of Squadron A, of which organization he was a member. Shortly after his enlistment he was given the grade of Lieutenant and transferred to the Signal Corps under General Greely. Later he was promoted to a Captaincy in this Corps. He expects to be able to return to duty at the University in October.

Mr. George F. Sever, Instructor in Electrical Engineering, being a member of the Naval Reserve, was ordered in May to take charge of the signal station at Montauk Point. With the destruction of Admiral Cervera's fleet, the signal stations along the coast were largely reduced in number, and Mr. Sever was able to report for duty at the University in the early summer.

Dr. John H. Claiborne, Instructor in Ophthalmology, went to the front as Adjutant of the 12th Regiment of N. Y. Volunteers.

I have endeavored to ascertain the names of all students who enlisted either in the army or the navy, and the full list is given in the appendix to this report. It appears that there went from the College, 6; from the School of Law, 7; from the College of Physicians and Surgeons, 21; and from the Schools of Applied Science, 13. Two of the employees in the Bursar's office also volunteered. It does not appear that any of the officers or students have lost their lives during the war, though one, at least, has been at the point of death from typhoid fever contracted in camp. At the Battle of Guantanamo, the Surgeon of Marines who was killed, Dr. John Blair Gibbs, was a graduate of the College of Physicians and Surgeons in the Class of 1882. Hamilton Fish, Jr., a sergeant in the Rough Riders, who was killed at the Battle of Las Guasimas, was a member of the College for several years in the Class of 1895. I have not learned of any other Columbia graduates who have fallen in battle. One of the graduates of the College of Physicians and Surgeons, in 1898, Dr. George W. Lindheim, met a singularly tragic fate. Being put in charge of a train of fourteen cars, with orders to carry more than 200 soldiers sick with typhoid fever from Chickamauga to New York, he brought every man committed to his care in safety to his destination, only to perish himself of the dread disease in the moment of his triumphant achievement, worn out by anxiety and stung to death by unjust criticism. His name deserves to be remembered among the heroes of the war. Happily, the total losses of the war have been very small. It is evident, however, that in this day of trial the men of Columbia have kept unfalteringly the pledge that was made in their name to love, cherish, and defend the country's flag.

I gladly record that the University has maintained at full pay all of its officers and employees who have been absent on leave by reason of the war. Students in the graduating classes who were ordered to the front were granted degrees without examination when their previous records justified it. Other students were given leaves of absence with the privilege of returning without prejudice, whenever the war should end.

Before breaking up for the summer, the members of the University formed themselves into a Red Cross Auxiliary, so that all might feel that they were doing something for the soldiers and sailors who were to fight the country's battle. The officers and students of Barnard College and of Teachers College gladly joined in this movement and did their full share in making it successful. The sum collected and transmitted to the Treasurer of the National Association was in excess of $6750. The details of the organization are given in the appendix to this report.

NEW EDUCATIONAL DEPARTURES

The occupancy of our new home has made some educational departures possible which heretofore have been out of our reach. For the first time, on beginning its work in the autumn, the University will have a properly equipped gymnasium under its control. Dr. Watson L. Savage, who this year has been Adviser on Physical Training, has been appointed Director of the Gymnasium. In consultation with him, arrangements have been made to require two hours of work per week in the gymnasium of the first two classes both in the College and in the Schools of Applied Science. The freest possible opportunity is to be given to all the students of the University to profit by the gymnasium, and it is hoped that the use of it will be very general. It is safe to say that no university in the country needs a gymnasium more than Columbia; for the conditions of life in a large city increase the need for regular and systematic exercise, while at the same time making such exercise very hard to get. Students who will form in their youth the habit of taking regular exercise, if they persist in it as they grow older, will, barring accident, both prolong their years and increase their efficiency year by year. The gymnasium and the baths attached to it are to be opened to officers and alumni of the University on the same terms as to students. The building is upon a large scale and will compare favorably with the gymnasium of any university.

The first year in the new buildings has naturally been one of adjustment; and, in some directions, little could be done beyond fitting the life to the new surroundings. It is evident, however, that Columbia is now equipped to do a much greater service than it has hitherto been able to render. It is also clear that a plant of this magnitude ought not to lie idle for a quarter of the year. Accordingly, at the last meeting of the University Council, a committee was authorized to consider and report upon the question of a summer school to be conducted at Columbia, substantially upon the basis of those which have proved successful elsewhere. It is much to be hoped that a scheme for such a school can be prepared which will command the approval of the Trustees. As Columbia is situated at the moment, the problem is not without difficulty; but it is believed that it can be successfully solved.

It has become evident, also, that the demand for Columbia graduates as professors and teachers is growing in all parts of the country. To give direction to this demand, an Appointment Committee has been authorized by the University Council, whose business it is to recommend proper men for places for which we are asked to make nominations, and to secure positions, when possible, for men who otherwise might not become aware of the opportunity. Both of these steps emphasize the broader relations with the educational work of the country at large into which Columbia University has entered through the developments of the last few years.

The year has witnessed another most important step in the same direction, in the closer union that has been brought about between Columbia University and Teachers College, which also has been made possible by our removal to Morningside Heights. Several years ago, as soon as it was known that the University and Teachers College were to be neighbors, a tentative arrangement was entered into between the University and the College, looking to the exchange of privileges for the advantage of the students of both. So long as the two institutions were three or four miles apart, the arrangement was interesting, rather than valuable. When they became in fact near neighbors, the arrangement was soon found to be inadequate. Accordingly, during the year, a closer union has been entered into by the unanimous action of the Trustees of both the University and Teachers College. By the terms of this union, the Trustees of Teachers College continue to be responsible for the financial management of the College and for the general direction of it as a corporation. On the other hand, educationally, Teachers College becomes a part of the University system. The President of the University becomes ex-officio the President of Teachers College. Certain of the professors of the University become ex-officio members of the Faculty of Teachers College; and Teachers College enjoys the representation of a professional school on the University Council through its Dean and an elected member of its Faculty. In other words, Teachers College is accorded university standing as a professional school for teachers, upon the same basis as our School of Law or our School of Medicine. It is pleasant to report that Teachers College has fallen into line with these arrangements in the best of spirit, and the prospects are that the results of the union of the University and the College will justify immediately the hopes of those who have brought the union about. Teachers College offers all the opportunities for practice teaching that are characteristic of the normal school, besides many special opportunities for research, while the University strengthens the whole situation from the point of view of educational theory and of instruction in subject matter. Together, the facilities they offer for instruction in teaching and for the study of education are unique. By this connection, Columbia is brought into closer contact with the public-school system of the country than before; while Teachers College, in its turn, acquires a standing in educational circles that promises it a larger sphere of usefulness than ever.

It is interesting to report that the University, through the co-operation of Teachers College, has already been able to enter into friendly relations with the Brooklyn Institute of Arts and Sciences, with the object of conducting in Brooklyn, next winter, certain courses of lectures for teachers that promise to be very useful. Such an arrangement probably could not have been brought about with success either by the University or by Teachers College, except for the union which had already taken place between them.

BARNARD COLLEGE

The establishment of Barnard College in a large and beautiful home of its own, directly across the Boulevard from the University, has also brought the University, in some ways, into closer relations with Barnard College than heretofore. The growth of Barnard College, present and prospective, has brought into prominence certain phases of the relationship between the University and Barnard College which seem to me to call for readjustment upon what may be called a permanent footing. Barnard College, as is well known, began its career in 1889, with no endowment, with no building, and with nine candidates for the degree of Bachelor of Arts. There were besides a few special students, but not many. In less than a decade, it has secured, by the generosity of its friends, a beautiful group of buildings, which, with the ground upon which they stand, represent a value of not less than $700,000. The number of its students has increased also to 234, of whom 161 are candidates for a degree.

Until now the relations between Barnard College and the University have been very vague. I think the time has come to embody them in a formal agreement. When Barnard College was established, it was the expectation that all of the instruction leading to the degree of Bachelor of Arts should be given to the young women separately. This, naturally, should be made a part of the agreement. I see no reason, however, to deprecate the generous admission of women who have already taken the first degree to the advanced courses of the University under all the non-professional faculties. The question as it relates to the professional schools is a different one and is not now pressing. During the year just closed, the Faculty of Political Science have for the first time agreed to throw open to women holding the first degree the advanced courses in history and political economy.

In one particular I think the relations between the University and Barnard College should be modified. Up to the present time, Barnard College has made its own arrangement with individual members of our teaching force for the giving at Barnard College of such instruction as it may desire. This system, on a small scale, has not worked badly; but, with the changes in the curriculum of Columbia College, which have greatly enlarged the scope of the elective privilege in the course leading to the degree of Bachelor of Arts, it becomes more and more difficult, on both sides, to cope with the embarrassments of such a system. The inevitable conflict of hours makes the preparation of a time-table at Barnard College exceedingly difficult. On the other hand, it is not always easy for the President to maintain an even balance between the claims of Columbia College and of Barnard College upon individuals who, though primarily in the service of the University, are in the pay of both. The President strives to be fair to all concerned. I think, however, that the time has come, in the interest of both institutions, when the students in Barnard College should be considered as forming, in effect, simply so many additional sections in the work of Columbia College. In other words, I think Barnard College hereafter, instead of making its arrangement with individual teachers, should pay the Trustees of Columbia College a sum sufficient to secure all of the instruction needed in Barnard College, and that this instruction should be furnished at Barnard College, under suitable regulations, by the various departments of Columbia College, precisely as it would be furnished were it to be given in Columbia College itself. Such a system would obviate all of the disadvantages I have noticed in the present arrangement; and it would cause Barnard College to become, in return for what it gets, a source of strength to the University. This is well illustrated by what has already taken place. Barnard College, for a series of years, has maintained three professorships in the University. As consideration for these professorships, the University has given to Barnard College as much instruction as these three professors give to the University. The University makes no gain under this system in the number of hours of instruction that it offers; but, on the other hand, its teaching force is strengthened and the field which the

University can cover well is enlarged. This is equally true of Barnard College under this arrangement. Any outlay for instruction made by Barnard College in this form, therefore, is much more advantageous to both institutions than when it is made by way of a personal arrangement between Barnard College and the instructors already in the service of the University. I think this system may well be incorporated at large in the formal agreement which I have suggested between Barnard College and the University.

RETIREMENT OF OFFICERS

In March, 1898, Dr. James W. McLane, after thirty years of active service as a teacher in the College of Physicians and Surgeons, presented his resignation of the chair of Obstetrics, to take effect at the end of the academic year. Dr. McLane's resignation was accepted in accordance with his desire, but with very great regret, and he was appointed Emeritus Professor of Obstetrics from the day that his resignation takes effect. Happily, Dr. McLane was willing to continue as a member of the Faculty and to hold the office of Dean, by virtue of which office he will continue to represent the College of Physicians and Surgeons on the Board of Trustees of the Roosevelt Hospital, the Sloane Maternity Hospital, and the Vanderbilt Clinic. It has been Dr. McLane's good fortune to be identified with the College of Physicians and Surgeons at one of the turning-points of its history. Very largely through his endeavors the College was able to move from the inadequate quarters which it occupied for many years on the corner of Fourth Avenue and Twenty-third Street, to its present location upon Fifty-ninth Street; and again largely through his influence the College became an integral part of Columbia University in 1891. During all this period, Dr. McLane has been doing the best of service as a teacher. His command of his subject is complete, and his presentation of it is clear and effective. Recognizing that practical instruction in obstetrics is as important to the student as the theory of the subject, he exerted his influence successfully to secure the foundation of the Sloane Maternity Hospital upon the grounds of the College of Physicians and Surgeons, and in close affiliation with it. This generous foundation, made by Mr. and Mrs. William D. Sloane, has given to the College of Physicians and Surgeons an easy primacy in this country for education in this special field of medical practice. Every graduate, when he receives his degree, has had some practical experience in the Maternity, and is better equipped for practice in obstetrics than he might be after several years of experience without such an opportunity. Dr. McLane's relationship to the chair of Obstetrics, therefore, has been marked by results as permanent and notable as those which have illustrated his career as President and Dean of the College of Physicians and Surgeons. It is not to be wondered at, that after thirty years of continuous teaching he should seek relief from the daily obligations of a professor's chair; but it is also easily understood why the retirement of such a man from active service as a teacher is accepted with profound regret. I am happy to be able to report that Dr. McLane's colleagues of the Medical Faculty have presented to the University a fine portrait of Dr. McLane, painted for the purpose by Mr.

Daniel Huntington. The portrait is to hang in the large lecture room of the College of Physicians and Surgeons, by the side of the portraits of other men who have helped to make that famous medical school what it is.

In June, 1898, Dr. William H. Draper presented his resignation as Professor of Clinical Medicine, to take effect at the close of the academic year, thus terminating a continuous teaching service in the College of Physicians and Surgeons of forty years' duration. Dr. Draper, although never a member of the Faculty, is another of the men who have helped, by their own reputation and by their service as instructors, to give to the College of Physicians and Surgeons its great renown. The University is fortunate in Dr. Draper's case, also, in retaining his services as a Trustee of the University, though reluctantly obliged to admit that his claim to be relieved from teaching after so long a service is too strong to be denied.

Through the retirement of the Rev. Thomas S. Hastings, D.D., from the Presidency of Union Theological Seminary, a vacancy was created in the University Council because of his retirement also as the representative of the Seminary in the Council. The vacancy in the Council has been acceptably filled by his successor as President of the Seminary, the Rev. Charles Cuthbert Hall, D.D. ; but it is fitting to make record, at this time, of the pleasure and advantage which have accrued to the Council from the presence in it of the Rev. Dr. Hastings. Hardly any member has been more punctual in attendance than he, and his clear views on educational questions have always been welcome and valuable.

GIFTS

A number of interesting gifts have been received during the year, apart from those for the ornamentation of the new site already mentioned. The friends of the late Joseph Mosenthal have presented the sum of $7500 for the purpose of establishing the Joseph Mosenthal Fellowship in Music. The incumbent of the Fellowship is to be appointed every second year, and is to pursue studies in musical composition either at Columbia University or elsewhere, under the direction of the President and the Professor of Music. Both men and women are eligible to appointment.

By the generosity of Mr. Jacob H. Schiff, the Schiff Fellowship in Political Science has been established, with an endowment of $15,000. The income of this sum, at four per cent., is to be paid to the Schiff Fellow, who is to be appointed annually on the nomination of Mr. Schiff, during his lifetime, and afterwards by some representative of the family, as outlined in the letter of gift.

Miss Catherine W. Bruce has added to her previous gifts to the Department of Astronomy by making a contribution of $1600 for the work of computation during the year, and by presenting a fund of $5000 wherewith to establish a lectureship in Celestial Mechanics for five years, to be filled by Dr. George W. Hill. Dr. Hill's eminence as a mathematical astronomer is so well understood in scientific circles as to make his connection with the University a matter of satisfaction to all who rejoice to see distinguished scientific service honored. The thanks of all scholars are due to Miss Bruce for making it possible for Columbia to give to Dr. Hill the university appointment he so well deserves.

Mr. Charles H. Senff has fitted out, for the Department of Zoölogy, an expedition to Africa in search of some rare types of fishes. This is only part of his generosity to the University.

Dr. J. Ackerman Coles has continued his generous gifts to the University of fine reproductions of ancient bronzes. During the year he has presented the busts of Homer and of Æsculapius, and reproductions on a small scale of "The Dying Gaul" and "The Farnese Bull."

The summary of money received by way of gift during the year is interesting :

For current uses :		
Salaries	$16,250 00	
Lectureship	5,000 00	
Lectures	250 00	
Fellowships	2,125 00	
Scholarships	200 00	
Toppan Prize	150 00	
For the Purchase of Books	14,784 27	
For Equipment	3,900 00	
For Supplies	7,257 37	
For Zoölogical Expedition	2,000 00	
		$51,916 64
For permanent endowment :		
Mosenthal Fellowship	$7,500 00	
Schiff Fellowship	15,000 00	
On account of Trowbridge Fellowship	1,000 00	
On account of Library Building	125,000 00	
On account of Schermerhorn Hall	50,000 00	
From Fayerweather Estate	100,000 00	
From Beck Estate	2,500 00	
From Class of '82, for class gate	1,500 00	
		302,500 00
		$354,416 64

The Baccalaureate sermon of the year was preached by the Rev. Henry Van Dyke, D. D., in the large chemical lecture room of Havemeyer Hall. It was pleasant to hold the Baccalaureate service upon our own grounds; but the occasion added to the desire that everyone must feel for a university chapel. A suitable place upon the grounds has been set aside for this purpose, but the University has no funds with which to build the chapel. It is greatly to be hoped that someone who understands how necessary a chapel is as a centre for the religious life of the University, will be moved to erect one for us at no distant day.

The Committee on Aid for Students has secured opportunities for students needing aid by which they have been able to earn about $2500. The amount is somewhat smaller than that secured during the preceding year. The falling off is probably due to the greater distance of the new site from the business centre of the city.

THE LIBRARY

The Library at Forty-ninth Street, as stated in my last report, was closed to the public on June 12, 1897. It was reopened for the circulation of books, at the new site, on October 12, 1897. The actual work of removing the books, owing to delays in the completion of the steel stacks in the seminar rooms of the new building, could not begin until August 23d. The transfer of the books, therefore, was substantially completed in little more than six weeks. While the new building was practically finished at the opening of the term, its full facilities became available only gradually. The general reading-room was opened to readers on November 1st. It was not until November

15th that this reading-room could be open in the evening. The Avery Library was opened to the public on January 8, 1898. From January 28th, until the close of the academic year, all of the reading-rooms were kept open until 11 P.M. The evening use grew to considerable proportions during the year. It varied in amount from the smallest number, 13, on the evening of June 18th, ten days after Commencement, to the largest, 116, on May 11th, just prior to the closing examinations. The average of evening attendance by months was as follows: January, 35; February, 43; March, 56; April, 67; May, 66; June, 24. During the summer, only the main reading-room and the Avery Library have been open during the evening.

The removal of the Library from one building to another afforded an unusual opportunity to take an accurate and complete inventory of the books. Since 1883, the Library had been administered in the building upon the Forty-ninth Street site in the freest possible way. Probably 100,000 volumes, more or less, had been accessible upon the shelves to any and every reader obtaining entry to the building. It was well understood that this privilege of ready access to the shelves was likely to involve a certain loss of books year by year. On the other hand, it was believed that this loss would be a small price to pay for the advantage to the great body of students of having access to the books upon the shelves. The inventory, when completed, showed 1650 volumes unaccounted for. Of this number, 282 were found on rearranging the books in the new building. Upon the basis of these figures, during fourteen years the losses have amounted to a little less than

100 volumes a year, or 8 volumes a month. These figures seem to be rather larger than they ought to be, and yet I think there is no disposition to limit in any serious way the privilege of access to the shelves. The arrangements of the new building lend themselves perhaps rather better than the old to the protection of the Library against losses of this kind. The following summary of the missing books shows the general heads under which the losses have taken place:

Bibliography	19	vols.
Philosophy	38	"
Religion	21	"
Sociology	220	"
Philology	37	"
Natural Sciences	245	"
Useful Arts	113	"
Fine Arts	25	"
Literature	499	"
History	223	"
Phœnix Library	142	"
Rare Books and Special Collections	43	"
Reference Books	25	"
	1650	

The number of volumes added to the Library during the year was 16,377. Of these, 5636 volumes were received by gift. The additions for the last five years have been:

1893–94	15,161
1894–95	24,839
1895–96	20,584
1896–97	11,928
1897–98	16,377

The falling off in the rate of increase during the last two years is accounted for by the interruption in the work of the Library incident to its removal. During 1896–97, no effort was made to secure money for the purchase of books, as it was thought to be undesirable to maintain a large inflow of purchases when the Library was about to be moved. During 1897–98, also, the first half of the year was practically given up to taking possession of the new quarters. During the last six months of this year, on the other hand, the additions amounted to 9840 volumes, a rate of increase very little below that of 1895–96.

The statistics as to the use of the Library, as indicated by the record this year of loans of books to be read at home, have also been affected by the abnormal conditions of the year, inasmuch as the statistics cover only eight and a half months of use. For the last eight years the record of loans is as follows:

1890–91	22,721
1891–92	26,632
1892–93	28,184
1893–94	42,015
1894–95	53,471
1895–96	59,756
1896–97	67,975
1897–98	47,832

During the same period of eight and one-half months, this year, there were delivered to readers for use in the general reading-room, 30,373 volumes. These figures have never been available before. About 50 volumes a day, on the average, have been used in the Avery Architectural Library. There is no means of knowing the extent of the use made of the 10,000 volumes of reference books on the shelves of the main reading-room to which the readers have free access, nor of the current periodicals, nor of the books daily used in the seminar rooms. It seems a reasonable inference, however, from such statistics as are available, that the use of books in the Library Building has greatly increased by reason of the greater facilities afforded there to readers, while it is evident that the use of books to be read at home has fallen off very little, if at all, from the figures of previous years.

At the new site, the system of departmental libraries has been largely extended. This has been made possible by the facilities for such libraries which have been provided in the new buildings. The departmental library contains, for the most part, the books and periodicals which are of interest only to the specialist. Any book so shelved can be withdrawn for use in the general reading-room, or, in case of need, for home use. Practically, the system places the books which are of interest to the specialist directly under his control, and treats the occasional reader as the exception rather than the rule. In the absence of the departmental library, just the reverse is the effect. The system of departmental libraries is especially useful at the new Columbia, because, in almost every case, the departments naturally affiliated to each other are found under the same roof, and the departmental libraries of kindred departments, therefore, are easily accessible to the students of all. The Librarian's report gives interesting details concerning these libraries.

The Librarian reports two interesting experiments in connection with the cataloguing of books. By an arrangement entered into between our own Library, the New York Public Library, the John Crerar Library in Chicago, the Boston Public Library, and the Harvard University Library, the current numbers of a selected body of scientific periodicals and transactions of learned societies have been systematically indexed. Each library furnishes the copy for certain periodicals assigned to it. The work of printing these entries on regular catalogue cards is assumed by the publishing section of the American Library Association, which likewise receives subscriptions from other libraries for the cards thus made. This work has been carried on systematically since January 1, 1898, for 184 current publications. Our Library has received, as a result of this arrangement, 2546 indexed cards, at a cost of $6.99. This is hardly more than one half of the cost of the same number of blank cards.

Again, in co-operation with the New York Public Library, lists of sets of periodicals relating to different subjects, contained in the two libraries, have been published in the monthly Bulletin of the New York Public Library. By means of this list, a student can determine at once what periodicals relating to the subject in which he may be interested can be found in either or both libraries. It is gratifying to report that the disposition to carry the policy of co-operation as far as it can be carried to mutual advantage, is strong in both these libraries.

The Library has been fortunate once more in securing gifts of money for the purchase of books. Mr. Samuel P. Avery has given, for the purchase and binding of books in the Avery Library, in addition to the income of the endowment fund of $25,000, the sum of $2,207.27. He has also presented to the Library many interesting and valuable volumes. Out of a sum remaining in the hands of the President, received from Mr. Charles H. Senff a year or two before, the sum of $900 was set apart early in the year for the purchase of books in American history. The sum of $5000 was given by the President for the purchase of books in history, most of which is to be used for the purchase of books relating to the period of the Reformation and the period of the French Revolution. It is hoped to make our resources as complete as possible in one period after another, so that students wishing to investigate any given period will find here, at any rate for the periods that we cover, the fullest possible equipment.

By the arrangement entered into with Mr. Joseph F. Loubat, the Duc de Loubat, the Library has received the assurance of an endowment which ultimately ought to add very largely to its usefulness. Mr. Loubat has presented to the University certain property on Broadway and Mercer Street in New York City, subject to an annuity, during his life, of $60,000 per annum. The value of the property is estimated at $1,100,000, and, at Mr. Loubat's death, the equity in it is to form the Gaillard-Loubat Library Endowment Fund, the income of which is to be available both for the maintenance and for the increase of the Library. It is impossible to say what a fund so conditioned will amount to, nor can it be known when it will become available. On the other hand, this generous provision of Mr. Loubat can hardly fail ultimately to provide the Library with a very substantial endowment. In the meanwhile, it is hoped that the friends of the Library will appreciate that its immediate needs are in no way diminished by this provision for its future. The Library, like the University, will need the hearty support of its friends, precisely as though this arrangement with Mr. Loubat had not been entered into.

The Librarian's report gives interesting details in regard to the removal of the Library and to the general work of the year in connection with its care and growth.

ATTENDANCE

The number of students in attendance upon the University for each of the last six years is given below:

1892–3	1893–4	1894–5	1895–6	1896–7	1897–8
1641	1805	1943	1871	1921	2157

It will be perceived that the expectation of a considerable increase of numbers over last year has been realized. There has been a gain all along the line, but the increase at the College of Physicians and Surgeons is a little less than was anticipated. Besides the students directly enrolled in the University, the students in Barnard College and in Teachers College are directly within the sphere of its influence. In Barnard College there have been this year 243 students, and in Teachers College 139 students. These do not include the pupils in the school of observation and practice, nor those attending the extension classes connected with Teachers College. In addition, 29 persons have availed of the privilege of attending lectures as auditors. The total number of students under the educational control of the University during the year, therefore, has been 2568.

In the tables showing the geographical distribution of our students, all who live within the territory recently consolidated with the city of New York are credited, as they will be hereafter, to New York City.

	1894–95	1895–96	1896–97	1897–98
New York City	1084	1040	1073	1210
New England States	117	103	111	131
Middle States	513	502	499	525
States north of Ohio River and east of Mississippi River	57	65	74	87
States south of Ohio River and east of Mississippi River	56	43	47	59
States west of Mississippi River and east of Rockies	60	64	64	64
States west of Rockies and on Pacific Coast	24	22	27	41
	1911	1839	1895	2117
Foreign countries	32	32	26	40
	1943	1871	1921	2157

From these figures it appears that the growth has come from the city and from a distance in about the same proportions. The local increase is 137; the outside increase is 99.

GRANTS OF AID

I think it is not at all appreciated how large a sum is annually appropriated by Columbia for fellowships and scholarships or waived in free tuition. The total amount of such grants, this year, was $58,698. It is evident, therefore, that Columbia is giving generously, as she has received. I am glad to report that a plan is under consideration which promises, if adopted, to make these large grants even more effective than now.

THE COLLEGE

It is gratifying to be able to report that the number of students in attendance upon the College during the first year of our occupancy of the new site has been greater than ever before in the history of the College. The figures are as follows :

Seniors	49
Juniors	55
Sophomores	93
Freshmen	108
Specials	30
	335
University students taking one or more courses in the College	6
	341

The removal to the new site has been coincident with the introduction of a new curriculum in the College, which greatly extends the number of electives. It also provides for admission to the College upon alternative groups of subjects. Reference is made to the report of the Dean for full details in this regard. The system is too new as yet to permit of very profitable discussion. Perhaps the only items of general interest are the following : 51 Freshmen entered in Group I, presenting with the other usual subjects, Greek and French ; 44 entered in Group II, presenting Greek and German ; and 13 entered in Group III, presenting, in lieu of Greek, a natural science with laboratory work, both French and German, and also advanced mathematics. Of 95 Freshmen entering upon Greek, 35 continue the study of both Greek and Latin during the year. There is no evidence that the privileges of election have been abused in any instance. Indeed, these privileges, while very real, are subject to such control by the Dean, in case of need, that serious abuse is hardly possible. The Dean of the College says in his report : " It is too early, perhaps, to speak with full authority as to the effect of removal to the present site, and of the enlarged and diversified curriculum that became operative at the beginning of the present year. The apparent effect of both departures has been highly favorable."

The following tables relating to entrance examinations are given for the first time. The first shows the number of candidates in 1897 who presented themselves for examination in each subject. The second shows the percentage of failures in each subject. The total number of candidates was 151 :

		Per cent.
English	141	93.4
Latin	143	94.7
Arithmetic	144	95.4
Algebra	141	93.4
Geometry	141	93.4
Greek	128	84.8
French	93	61.6
German	78	51.6
Advanced Algebra	16	10.6
Advanced Geometry	16	10.6
Chemistry	9	6.
Physics	5	3.3

	Percentage of failures in Preliminary Examinations only	Percentage of failures in Finals only	Percentage of failures in complete records including successful Preliminaries
English	54.8	26.2	24.8
Latin	34.	44.2	39.9
Arithmetic	12.1	8.1	4.2
Algebra	34.4	12.6	8.5
Geometry	35.	11.7	10.6
Greek	15.3	47.1	44.5
French	77.8	46.5	43.
German	50.	21.3	20.5
Advanced Algebra		18.8	18.8
Advanced Geometry		18.8	18.8
Chemistry		—	—
Physics		20.	20.

I continue the table showing the number of Columbia Bachelors of Arts who remain students in the University after graduation from the College :

1893–94	55
1894–95	68
1895–96	74
1896–97	80
1897–98	75

The number shows a small falling off, but the loss is so slight as to be without special significance.

Some of the statistics heretofore given have lost their significance through the change in the College curriculum. These, therefore, are omitted. The following statistics, however, seem still to be of interest :

The Seniors of the College, in the exercise of their privileges, have studied under the following Faculties :

	1895–96 54 in class	1896–97 53 in class	1897–98 49 in class
Law	12	10	9
Medicine	6	3	3
Applied Science	7	4	2
Political Science	37	52	33
Philosophy	44	53	40
Pure Science	24	24	17

For the first time, all of the Seniors who have studied both law and medicine have done so with the intention of practising. The figures for the last three years are as follows:

	1895–96		1896–97		1897–98	
	Law	Medicine	Law	Medicine	Law	Medicine
Intending to practise	10	6	6	1	9	3
Not intending to practise	2	0	4	2	0	0
	12	6	10	3	9	3

The following table shows the number of Seniors electing courses under one faculty alone, and those electing courses under more than one faculty.

	Studying under one Faculty	Studying under two Faculties	Studying under three Faculties
1891–92	3	20	15
1892–93	15	38	12
1893–94	31	45	7
1894–95	8	38	11
1895–96	15	21	15
1896–97	12	24	17
1897–98	5	26	18

Apparently more Seniors value the wide privilege of study which is open to them than care for the opportunity which is equally theirs of concentrating their work.

The number of students admitted upon certificate from other colleges is given in the accompanying table:

	1895–96	1896–97	1897–98
To Freshman Class........	3	3	7
To Sophomore Class.......	7	3	5
To Junior Class...........	4	3	3
To Senior Class...........	6	2	4
	20	11	19

On the whole, the work of the College during the year has been most satisfactory, and its future seems to be full of promise. I wish that some alumnus, or other friend, would give a building that might be the permanent home of the College. At present, the office of the Dean is located, with the Departments of Greek, Latin, and Mathematics, in one of the old buildings that were upon the site when it was purchased. The building is well lighted, and, so far as it goes, is pleasant enough; but it is wholly inadequate for the accommodation of the College, and at best meets the needs of the situation in a partial and temporary way. The Dean was offered headquarters in one of the new buildings; but it seemed to him so important that the College should have headquarters of its own that he chose for occupancy the building where he now is. This building is known as College Hall. It is hoped that it will prove to be only the forerunner of a worthier College Hall soon to take its place.

THE SCHOOL OF LAW

The School of Law has had 376 students, the greatest number since its reorganization in 1892. It is especially gratifying to report that the percentage of college-trained men among the students has also increased perceptibly. In the entering class of last year, the percentage of college graduates in the School as a whole rose from 59$\frac{3}{8}$% to 62$\frac{5}{8}$%. It is interesting to report that a larger percentage of the Second and Third Classes returned to the School last year than in any previous year. Upon the old basis, I apprehend that it would have been impossible to remove the Law School to our present site without very great disadvantage. In 1885–86, the School of Law numbered 344 students and the percentage of matriculants holding the college degree in that year was 42%. In 1885–86, the law course was a two-year course. The same instruction was duplicated in the morning and in the afternoon, so that the classes could be divided into two sections, one set of men being in offices in the morning and in the School in the afternoon; the other set being in the School in the morning and in offices in the afternoon. The reorganization of the School in 1892 involved the adoption of a three-year course so administered as to permit no duplication of instruction, with lectures given at such hours as to make it impossible for students of the School to be at the same time in law offices. In six years, therefore, from the date of its reorganization, the School is larger, on the basis of demanding three years of a man's whole time, than it was twelve years ago on the basis of requiring two years of a small part of his time.

During the year, Dr. John Ordronaux, who, at the end of the previous year, had retired from the chair of Medical Jurisprudence, which he had held almost from the foundation of the School in 1858, was appointed by the Trustees, in recognition of his long and willing service to the School, Emeritus Professor of Medical Jurisprudence. It is gratifying that the name of Dr. Ordronaux will thus remain upon our records as long as he lives.

The usual statistics in regard to the School are given herewith:

	1894–95	1895–96	1896–97	1897–98
Men holding Columbia degrees	25	29	32	35
Men holding other degrees....	100	140	180	193
	125	169	212	228
Columbia College Seniors.....	23	10	6	9
	148	179	218	237
Percentage of the whole School.	51 %	51 %	60 %	63 %
Total number in School.......	288	333	363	376

It is pleasant to observe the steady increase of Columbia graduates in the School, as well as of the graduates of other colleges.

THE COLLEGE OF PHYSICIANS AND SURGEONS

The new curriculum in the Medical School, which was begun four years ago, has now been completely established by the graduation of a class upon the four-year basis. The change in the instruction given in the Medical School has been much more profound than is indicated by the mere statement that the medical course has been lengthened from three years to four years. It is vitally characteristic of the new curriculum that it has extended and enlarged clinical opportunities for the students as widely as possible, and has strongly supplemented didactic teaching by demonstrations to sections of small size. This naturally has made the cost of installing the new curriculum very serious, but the results are exceedingly gratifying. The first class to graduate under the four-year curriculum has received the unqualified commendation of the Faculty. Only five members of the class failed to receive the degree at Commencement, and these five were conditioned in only one subject. They will undoubtedly receive their degree in the autumn. The students so graduating have obtained 54 of the hospital places filled by competition, in this neighborhood, out of a total of 58 places so filled. The actual cost of installing the four-year curriculum, as shown by the deficiencies of the last four years, has been $124,000. Now that the School is fairly upon the new basis, the numbers attending are likely to reduce the annual deficiency to a comparatively small sum. The Medical School has had this year 766 students as against 639 the year before. This considerable increase reflects the presence in the School of four classes instead of three.

It was feared by many that the lengthening of the medical course would have a tendency to decrease the percentage of men who would take a college education before studying medicine. So far, these fears seem not to have been well founded. The following table gives the number of students in the entering class for each of the last four years who have taken degrees of any kind before entering the School of Medicine. It appears that the last class to enter has the largest number and the largest percentage of such students of any year of the four.

	Degrees signifying a liberal education	Degrees signifying a technical education	Percentage in class of liberal degrees
1894–95	65	5	29
1958–96	68	3	28
1896–97	73	3	28
1897–98	81	4	39

The following table indicates that the percentage of the whole School made up of men holding degrees of one sort or another, has risen during the installation of the four-years' course from 37% to 42%.

	1894–95	1895–96	1896–97	1897–98
Men holding Columbia degrees	21	19	19	35
Men holding other degrees	269	246	221	284
	290	265	240	319
Columbia College Seniors	4	6	3	3
	294	271	243	322
Percentage of the whole School.	37%	38%	38%	42%
Total number in School	803	709	639	766

Dr. Edwin B. Cragin, a graduate of the College of Physicians and Surgeons in the Class of 1886, in view of the resignation of Dr. McLane as Professor of Obstetrics, has been appointed, according to the custom of the School, Lecturer in Obstetrics for the next academic year. It is naturally hoped that Dr. Cragin, in due course, will be promoted to the chair vacated by Dr. McLane. Dr. Cragin for several years has been the Secretary of the Medical Faculty, and in this position has acquired an intimate acquaintance with the School which is likely to serve him in good stead in many ways. His efficient service in that not altogether easy position merits the thanks of the Trustees; and it also increases the expectation that he will be successful in the new position for which his professional acquirements are believed to equip him thoroughly.

The Department of Physiological Chemistry in the College of Physicians and Surgeons has been equipped during the year for active duty in the autumn, the students in the medical course taking this subject during their second year. With the courteous consent of the authorities of Yale University, Prof. Russell H. Chittenden, Ph.D., of the Sheffield Scientific School, has been appointed Director of the Department of Physiological Chemistry and Lecturer therein for the next academic year. Professor Chittenden's duties, apart from the lectures to be delivered by him, will be those of organization and oversight. Under him, William J. Gies, Ph.D., has been appointed Instructor in Physiological Chemistry; and Alfred N. Richards, A.B., and Henry E. McDermott, A.B., Assistants.

THE SCHOOLS OF APPLIED SCIENCE

These Schools, also, have had the largest attendance of any year in their history. The following table gives the attendance on the different courses in this group of schools, formerly all included in the School of Mines:

	1st Class	2d Class	3d Class	4th Class	Total
School of Mines:					
Mining Engineering....	21	16	6	14	57
Metallurgy............	0	0	1	2	3
School of Chemistry....	14	9	7	5	35
School of Engineering:					
Civil Engineering.......	30	13	12	20	75
Electrical Engineering..	60	33	25	23	141
Mechanical Engineering	14	0	0	0	14
School of Architecture	42	13	11	10	76
	181	84	62	74	401

In addition to the students in the regular undergraduate courses, there were besides :

Candidates for the degree of Master of Arts	8
“ for the degree of Doctor of Philosophy	1
Special students	19
Making a grand total of	429

The number of students who have specialized in metallurgy has always been small,—never more than eight in any one year, and not more than five in any year since 1890–91. This is probably due to the fact that the difference between the course in metallurgy and the course in mining engineering has been very slight. Under the inspiration of Professor Howe, the course in metallurgy, beginning with next year, will be importantly modified. It will provide for more instruction in chemistry and electrical engineering, and less in mining and mechanical engineering. The addition to the Department of a metallurgical laboratory equipped upon an illustrative scale is likely further to increase the efficiency of its work.

The course in mechanical engineering was begun in the year under review. It commences with fourteen students. Unless all signs fail, it is likely to be, before many years, one of the largest courses in any of the Schools of Applied Science.

The Department of Mechanical Engineering has been greatly favored, because of the establishment of this course, with gifts looking to the permanent equipment of the Department. The hydraulic laboratory has been fitted up by Mr. Charles C. Worthington as a memorial of his father, Henry R. Worthington, whose name the laboratory will bear.

The unique feature of the equipment, which otherwise is complete and of the best character, is found in the facilities it offers for investigations and tests with water under great pressure, running as high as 5000 pounds to the square inch. This laboratory is to be used also by the Department of Civil Engineering for such illustrative and experimental work with the flow of water as lies naturally in the field of Civil Engineering.

The Edward P. Allis laboratory of steam engineering, also attached to the Department of Mechanical Engineering, has been equipped with equal completeness by Mr. W. W. Allis, of Milwaukee, as a memorial of his father, whose name it bears. Its principal equipment consists of a triple expansion experimental engine, a unique feature of which is that it is capable, by a very slight modification, of being transformed into a triple stage air-compressor, with a capacity for pumping, in three steps, from atmospheric pressure to 250 pounds. The flexibility of the design permits wide variations in the conditions of experiment.

Other gifts contributing to the efficiency of this plant are fully detailed in the report of the Dean of the Faculty of Applied Science. One of the most interesting comes from the Baldwin Locomotive Works of Philadelphia. This is the full-size locomotive named "Columbia," which was exhibited at the Chicago Exposition in 1893. This locomotive is to be so mounted that it can be run either under steam from its own boiler or by compressed air from the Allis engine. It will be fitted with all necessary appliances for measuring the consumption of water and fuel, and for determining the effects of varying the conditions of its operation with all ranges of speed. The money for its appropriate mounting has been contributed by various friends. The J. G. Brill Company of Philadelphia likewise have presented a typical electrical car, with the General Electric Company's motors, thus equipping the Department for the study of the mechanics of electric locomotion, as well as of steam locomotion.

The instruction given for the Department of Mechanical Engineering in the shops of Teachers College as a part of the course in mechanical engineering has been satisfactory. With the return of Prof. Charles R. Richards from the Pratt Institute to Teachers College, as Professor of Manual Training, the work in the shops is likely to continue of the highest character. It is evident, therefore, that the Department of Mechanical Engineering is already assured of an equipment for its work which, in some directions, is already superior to anything to be found elsewhere. It is reasonable to expect that each year will add to the completeness of its equipment, for the city of New York is the greatest manufacturing centre in the country. The course in mechanical engineering in Columbia University is sure, therefore, to attract to itself very large numbers.

The report of the Dean of the Faculty of Applied Science, attached to this report, is full of interesting statistics and suggestion, and will well repay careful perusal. The usual statistics are given herewith. While the Schools of Applied Science have grown in numbers, it does not appear that the percentage of college-trained men in attendance upon the Schools increases. It is to be hoped that the modification of the curriculum in Columbia College which enables men to take a combined course in six years, will induce more men to take a college course before entering upon the work of the Schools of Applied Science.

	1894–95	1895–96	1896–97	1897–98
Men holding Columbia degrees	8	10	11	13
Men holding other degrees....	44	35	42	40
	52	45	53	53
Columbia College Seniors.....	4	5	11	2
	56	50	64	55
Percentage of the Schools.....	12½ %	12 %	13 %	12 %
Total number in the Schools..	415	347	399	429

The following table relating to entrance examinations is given for the first time :

1897	Percentage of failures in Preliminary Examinations only	Percentage of failures in Finals only	Percentage of failures in complete records including successful Preliminaries
Arithmetic	9.	6.1	4.2
Algebra............	39.5	29.1	21.8
Geometry	29.4	24.6	20.5
Trigonometry		12.8	12.3
Physics	22.4	3.3	3.1
Chemistry..........	24.	12.3	11.5
English	65.2	41.	36.9
French		60.7	58.9
German............		33.8	33.9
History	40.9	17.1	13.
Drawing............	15.	8.3	6.6

THE SCHOOL OF POLITICAL SCIENCE

The work in this School has been successfully conducted during the year. The statistics indicate somewhat of a falling off in numbers, but an important increase in the percentage of college-trained men, as compared with the year before :

	1894–95	1895–96	1896–97	1897–98
Men holding Columbia degrees	36	38	31	40
Men holding other degrees....	135	197	163	180
	171	235	194	220
Columbia College Seniors.....	35	37	34	33
	206	272	228	253
Percentage of the whole School	62 %	73 %	62 %	82 %
Total number in the School...	332	346	366	310

The School received a high compliment by the invitation from the President of the United States to Professor Moore, the Hamilton Fish Professor of International Law and Diplomacy, to accept an appointment at the President's hands, as First Assistant Secretary of State. The early conclusion of the war with Spain encourages the hope that Professor Moore will be able to return to duty at the University before very long—probably not later than the commencement of the second half-year.

THE SCHOOL OF PHILOSOPHY

The work of the School of Philosophy does not seem to call this year for special comment. It is pleasant, however, to repeat the comment of the Dean ; that, " by common consent, the year just closed has been the most successful in our history." For purposes of comparison, the usual statistics are given. For further details, reference is made to the report of the Dean.

	1894–95	1895–96	1896–97	1897–98
Men holding Columbia degrees	38	25	38	51
Men holding other degrees....	82	122	99	121
	120	147	137	172
Columbia College Seniors.....	51	44	53	38
	171	191	190	210
Percentage of the whole School	90 %	84 %	72 %	82 %
Total number in the School...	190	227	263	255

THE SCHOOL OF PURE SCIENCE

For interesting details in regard to the work carried on in this School, reference is made to the report of the Dean, which includes detailed reports from the several Departments. It is evident that the removal to the new site, with its more ample facilities for scientific work, has resulted in a great impulse to such work all along the line. The statistics show a considerable increase in numbers. The proportion of college-trained men, on the other hand, is hardly preserved. The actual numbers are about the same, but the proportion is less than last year.

	1894–95	1895–96	1896–97	1897–98
Men holding Columbia degrees	13	8	22	21
Men holding other degrees....	30	24	61	72
	43	32	83	93
Columbia College Seniors.....	14	24	24	9
	57	56	107	102
Percentage of the whole School	86 %	66 %	72 %	55 %
Total number in the School...	66	85	149	184

The slight allusions by the President to the work of the year in the various schools of the University are significant of one thing. The period of extensive enlargement and of constant change has temporarily come to an end. So far as this means that the work of reorganization and rearrangement is completed, it is altogether a matter for congratulation. Nothing is more to be desired now for the University than a few years of steady, undisturbed work along the lines which have been laid down. Modifications of work from time to time are inevitable where there is healthy life; but when changes have been so numerous as at Columbia during the last few years, nothing is more welcome than the opportunity steadily to develop the work upon the lines chosen with such painstaking care. The teachers of the University are to be congratulated upon this opportunity almost as much as upon the new environment in which the work is to be conducted. Almost every dean in his report, and many of the heads of departments, have given expression to the feeling that the new environment is, in itself, full of inspiration. The abundant light, the great quiet, and the ample space at command, would alone be rewarding to men who have for years carried on their work upon the Forty-ninth Street block. When to these advantages are added the attractiveness and charm of noble architectural surroundings, it is easy to appreciate why the sense of inspiration is so general and so profound. The students remark upon it hardly less generally than the professors.

The customary statistics follow :

EDUCATIONAL STAFF

	1896–97	1897–98
Professors	60	63
Adjunct Professors	15	11
Clinical Professors and Lecturers	14	13
Demonstrators	3	4
Assistant Demonstrators	11	9
Instructors	36	48
Tutors	29	30
Assistants	34	45
Curators	3	3
Lecturers	15	13
Chiefs of Clinics	5	
Clinical Assistants	64	65
Officers of Instruction	289	304
Officers of Administration	13	12
Emeritus Officers	9	9
Total	311	325

The figures showing the attendance of students upon the University as a whole and without regard to schools, as between undergraduates, graduates, and non-graduates, have now been kept long enough to show some interesting results.

	College Undergraduates	Graduates	Non-Graduates	Total
1889–90	269	515	877	1661
1890–91	272	556	920	1748
1891–92	298	460	812	1570
1892–93	296	497	847	1640
1893–94	271	575	958	1804
1894–95	252	649	1041	1942
1895–96	262	659	950	1877
1896–97	307	672	942	1921
1897–98	335	805	1017	2151

The growth of the University has been fairly steady, though broken first by the reorganization of the Law School and later by the placing of the curriculum of the College of Physicians and Surgeons on a four-year basis. The increase in the number of students who have taken their first degree is very noticeable.

Comparing this year with last, the figures are as follows:

	Students		Percentage	
	1896–97	1897–98	1896–97	1897–98
Undergraduates..........	307	335	15.98	15.54
Graduates..............	672	805	34.96	37.29
Non-Graduates..........	942	1017	49.06	47.17
	1921	2157	100	100
Students from Barnard College:				
Seniors................	21	22		
Graduate Students.....	51	58		
	72	80		
Auditors................	25	34		
	2018	2271		

Comparing this year with 1889–90, the results obtained are these:

	Students		Percentage	
	1889–90	1897–98	1889–90	1897–98
Undergraduates.........	269	335	16.19	15.54
Graduates..............	515	805	31.01	37.29
Non-Graduates.........	877	1017	52.80	47.17
	1661	2157	100	100

Evidently there has been actual growth in all classes of students. The non-graduate students form a smaller percentage of the whole, by more than 5½%, than in 1890. In both years the non-graduates include the students in the School of Mines and its affiliated schools. Omitting these, there were in the University in 1889–90, out of 1661 students, 620 men who had not had a college or scientific training, and were not candidates for a liberal or technical degree. In 1897–98, out of 2157 students there were only 587 of this class. The students from Barnard College had not become a factor in the situation in 1890.

DEGREES CONFERRED IN 1897–98

Bachelor of Arts	45
" " in Barnard College	22
Bachelor of Laws	84
Doctor of Medicine	145
Engineer of Mines	19
Civil Engineer	21
Electrical Engineer	25
Metallurgical Engineer	2
Bachelor of Science	20
Master of Arts	86
Doctor of Philosophy	22
Master of Arts (Honorary)	3
Doctor in Sacred Theology (Honorary)	1
	495

It will be observed that more degrees of Master of Arts were given than of Bachelor of Arts.

SUMMARY OF STUDENTS BY SCHOOLS

	1896–97				1897–98			
	Holding a degree	Not holding a degree	Total	Percentage of degrees	Holding a degree	Not holding a degree	Total	Percentage of degrees
Law	210	147	357	59	228	139	367	62
Medicine	237	401	638	37	319	444	763	42
Applied Science	52	347	399	13	53	376	429	12
Political Science	53	14	67*	79	57	26	83*	68
Philosophy	80	20	100*	80	106	15	121*	88
Pure Science	40	13	53*	75	42	17	59*	71
	672	942	1614	42	805	1017	1822	44
The College		307	307			335	335	
			1921				2157	
BARNARD COLLEGE:								
Seniors............21					22			
Graduate Students..51			72		58		80	
			1993				2237	
Auditors			25				34	
Grand Total			2018				2271	

* Total number receiving instruction:

	1896–97	1897–98
Political Science	366	310
Philosophy	263	255
Pure Science	149	184

DEGREES HELD BY STUDENTS

Bachelor of Arts	549	
" " Literature	13	
" " Philosophy	48	
" " Science	131	
Doctor of Philosophy	6	
Master of Arts	94	
" " Science	7	
Testimonium Maturitatis	1	
Degrees signifying a liberal or general education.		849
Bachelor of Divinity	4	
" " Education	1	
" " Laws	6	
" " Pedagogy	5	
Civil Engineer	8	
Doctor of Medicine	26	
Electrical Engineer	6	
Doctor in Pharmacy	2	
Graduate in Pharmacy	15	
Master of Pharmacy	1	
Mechanical Engineer	2	
Mining Engineer	2	
Veterinary Surgeon	1	
Degrees signifying a technical education		79
Degrees		928
Students holding more than one degree		123
Total number of students holding degrees		805

Curiously enough, the number of degrees signifying a technical education has remained for three years at 79. The degrees signifying a liberal education have increased from 648 to 702 and now to 849.

NUMBER OF INSTITUTIONS REPRESENTED BY GRADUATE STUDENTS

	AMERICAN INSTITUTIONS	FOREIGN INSTITUTIONS
1893–94	118	18
1894–95	136	26
1895–96	136	23
1896–97	145	14
1897–98	151	18

INSTITUTIONS REPRESENTED BY FIVE GRADUATES OR MORE

	1896–97	1897–98
Adelbert College, O.	5	4
Amherst College, Mass.	17	21
Bates College, Me.	4	5
Brooklyn Polytechnic Institute	10	10
Brown University, R. I.	9	17
Colgate University, N. Y.	4	6
College of the City of New York	70	88
College of Pharmacy, N. Y.	9	16
Columbia University, N. Y.	128	136
Cornell University, N. Y.	4	8
Dartmouth College, N. H.	5	5
Harvard University, Mass.	60	73
Hobart College, N. Y.	4	8
Holy Cross College, Mass.	6	5
Johns Hopkins University, Md.	5	6
Lafayette College, Pa.	6	4
Leland Stanford Junior University, Cal.	11	12
Manhattan College, N. Y.	10	9
New York University	12	12
Princeton University, N. J.	36	57
Roanoke College, Va.	—	5
Rutgers College, N. J.	11	10
St. Francis Xavier College, N. Y.	10	21
Seton Hall College, N. J.	3	5
Trinity College, Conn.	14	15
Union College, N. Y.	5	3
University of Michigan	9	10
University of Minnesota	5	7
University of Rochester, N. Y.	4	7
University of Toronto, Canada	3	5
University of Vermont	3	8
University of Wisconsin	4	9
Wesleyan University, Conn.	7	8
Williams College, Mass.	11	24
Yale University, Conn.	86	77

Gain	9
Loss	3
Net gain	6

THE NEW SITE

With the completion of the gymnasium the work of immediately necessary construction at the new site is finished. When it was determined to transfer the

University to this place, it was evidently essential that the grounds should be suitably prepared for occupancy, and that enough buildings should be erected to permit the work of the University to be carried on efficiently. This work is now ended, and it is possible to show both what it has cost and its effect upon the finances of the University.

The cost of the various improvements is shown under the heads following. The items of construction include in each case not only the amount of the contracts for construction, but also all commissions and everything not properly chargeable to furniture and fixtures. The items of equipment include not only the usual items of furniture and fixtures, but such scientific equipment as the use to be made of the various buildings demanded.

COST OF LAND..................	$2,000,000 00	
Legal expenses..............	3,637 95	
		$2,003,637 95
LIBRARY:		
Construction	1,100,542 09	
Equipment	97,037 38	
		1,197,579 47
SCHERMERHORN HALL:		
Construction.................	457,658 17	
Equipment..................	35,786 35	
		493,444 52
FAYERWEATHER HALL:		
Construction	274,113 67	
Equipment..................	14,645 43	
		288,759 10
HAVEMEYER HALL:		
Construction	516,488 62	
Equipment	53,474 86	
		569,963 48
ENGINEERING BUILDING:		
Construction	284,075 50	
Equipment..................	20,325 47	
		304,400 97
Carried forward.........		$4,857,785, 49

Brought forward		$4,857,785 49
UNIVERSITY BUILDING:		
Construction	$842,887 85	
Equipment of power-house and connections	115,578 52	
Equipment of gymnasium	39,399 24	
		$997,865 61
VAULTS:		
East	30,382 79	
West	37,316 40	
		67,699 19
OLD BUILDINGS,—REPAIRS AND EQUIPMENT:		
West Building	10,252 67	
College Hall	5,113 34	
		15,366 01
INSURANCE		3,754 40
OUTSIDE STREET WORK		133,367 81
IMPROVEMENT OF GROUNDS AND INCIDENTALS		403,373 75
EXPENSES OF REMOVAL		59,987 56
INTEREST		339,812 08
		$6,879,011 90

The vaults are large covered spaces, made for the most part by abutting buildings. The East Vault lies between Schermerhorn and Fayerweather Halls; the West Vault between Havemeyer Hall and the Engineering Building. Each vault is 207 feet long, 35 feet wide, and 26 feet high. Both are well lighted from the top. The West Vault is used as a laboratory by the Department of Mechanical Engineering; the East Vault is used as a repair shop. The greater cost of the West Vault is due to the presence of rock in large quantities, necessitating much blasting.

"Outside Street Work" includes, for grading and paving streets and sidewalks, $38,801.95; for outside sewers, $29,358.92; and for fences and gates, $65,206.94.

"Improvement of Grounds and Incidentals" embraces these items: South Court, grading, paving, retaining walls, steps, etc., $123,000; grading, paving, and draining within the grounds, $57,000; transverse roadway with coal-storage vaults and sewer and interior tunnels connecting all the buildings, $79,573; retaining wall where the grade breaks, $15,921.38; architects' and engineers' commissions, $23,714.33; incidentals, about $100,000, of which $23,000 is reserved to meet unforeseen expenses that may or may not be incurred.

It is interesting to state that the estimated cost of equipment has not been exceeded in the case of any building. The actual removal, also, was accomplished within the sum appropriated therefor. Owing to the very large area of the grounds and the presence of much rock, the amount expended for sewers, foundations, and the like, has much exceeded the anticipated cost. On the other hand, it may be said that the entire area is now suitably drained, surrounded by efficient sewers, and generally adapted for the construction of further buildings from time to time without additional outlay for such work. The powerhouse, also, is built upon a scale ample for the needs of the University when the entire area shall have been built up according to the plan. Its equipment is not greatly in excess of the present need, but the structure is there, ready for the enlarged equipment as occasion may require. In other words, the University has met at the beginning and once for all, the heavy charges that have been necessary to put the grounds in proper condition. The result is seen in sightly surroundings that will not need to be seriously disturbed as further improvements are made.

When the President, in 1895, offered to present the Library Building to the University, he agreed to be responsible up to the sum of a million of dollars. In view of the fact that the completed accounts show a cost of substantially $1,100,000, the President has since made himself responsible for the full cost of the building.

On June 30, 1898, the net debt against the new site was a trifle less than $3,750,000. At 4 % the interest account against this debt is $150,000. Our problem is to meet this interest charge without cutting down the expenditures now necessarily incurred in maintaining our educational work. The University can pay off its debt, without difficulty and without disadvantage to its work of education, only when it is able to carry the interest account without drawing upon its endowments. If the income of endowments is to be used to pay interest, then educational opportunities must be withheld. It is not to be believed that the generous people of New York will permit it to come to this.

The amount still to be paid by the President on account of the Library assures the University five years within which to overtake its obligations. In the meanwhile, a Guarantee Fund has been started which promises to prevent any deficiency on current account during this interval. The income from endowments is not likely soon to increase, but during the last six years, the income of the University from fees has increased $112,000, or at the rate of $18,500 per annum. It does not seem to be an unreasonable expectation that, with the greater privileges offered at the new site, the increase of fees will average, from this time on, $20,000 per annum. Heretofore, the whole of the increase has been immediately availed of to broaden the educational work of the University. It is evident that this process must now cease, at least until the University can carry the interest on its debt out of its current income. If this period of marking time is not too long extended, it will be but a slight disadvantage. The University has grown, of late years, in every direction and with great rapidity, and an opportunity to adjust ourselves to our present conditions is to be welcomed rather than to be regretted.

It is important, however, that the University should be kept strong wherever it is actually at work; and, if the number of students in attendance grows, as it must grow, to produce such an increase of fees, some part of the increase must be kept available for the appointment of additional instructors in the fields already occupied. It is estimated that one-half of the actual increase will suffice for this purpose, and therefore that the sum of $10,000 may be assumed annually on account of interest as a charge against current income. If this expectation is borne out (and it is a wholly reasonable one), by the end of five years the current income will be carrying $50,000 of the interest account. If no help were to come from other sources in the interval, there would still remain then about $100,000 of interest to be annually provided for until it could be all taken care of by the growth of the University.

But, during these five years, every effort must be made to care for this item in other ways. From gifts and bequests, much may be hoped. In the last five years more than $2,000,000 have come from these sources for this single purpose. A very large sum in addition has been given for other purposes. It may not be easy to secure money specifically for the payment of the debt; but it ought not to be difficult to secure donors for the buildings which thus far bear no name; nor to secure endowment for many parts of our work, which appeals so widely to the sympathies of people interested in education.

One way in which our friends can greatly help us, if they will, would be to lend us money on the bonds of the University at 3 %. The bonds of the University are good beyond a peradventure, being protected, apart from other assets, by real estate alone which produces an income more than twice as great as the interest on the debt. If satisfactory arrangements could be made to fund the debt into bonds bearing 3 % interest, the problem would lose much of its difficulty; for this would reduce the interest account at once to a figure that could be rather easily taken care of. With government 3 % bonds selling at more than 5 % premium, 3 % bonds secured on New York City income-producing real estate worth more than double the amount of the bonds, are not unlikely, before long, to be marketable at par. I hope that this report will fall under the eye of some who will make known to me their willingness to underwrite a portion of the debt at this rate. If such a movement were started, it ought to go far; for the people of New York, I am confident, appreciate that Columbia has done a great public service in adorning the city by buildings and grounds that are at once an ornament to the city and the means by which the city ministers to better advantage to the education of its own people and of the people of the country at large. It may safely be said that New York's position as an educational centre would be far less secure if Columbia had not removed from its old site, or if, in removing, it had done so less worthily.

It is interesting to call attention to the fact that while the University has been engaged in developing the new site, the plant of the College of Physicians and Surgeons on Fifty-ninth Street has been improved by an outlay of $504,000. During the same period, the University has installed the four-year curriculum at the Medical School at a cost of $124,000 to its current income. Of the amount expended on improvements to the plant of the College of Physicians and Surgeons, the sum of $350,000 was the gift of the Messrs. Vanderbilt. The sum of $72,000 was furnished by funds belonging to the Medical School; and the remainder has been supplied by the University. There is an outstanding debt on this account of $82,000 ; but as the interest upon this debt has always been carried as a part of the current expenses, it can be easily dealt with.

Naturally, there is no form in which gifts can be made to the University, at the present time, so helpful as some form which will enable us to gain upon our interest account. On the other hand, it ought to be said that the buildings upon the new site furnish the minimum of equipment for the work which Columbia may reasonably be expected to do. When the plans of the University for the improvement of the grounds were being formed in detail, it soon became apparent that it was a waste of money to change old buildings so as to adapt them for the purposes of instruction in modern science. Apart from the library building, therefore, which, in addition to accommodating the Library, affords ample accommodations for the School of Law, the School of Philosophy, and the School of Political Science, all of the new educational buildings upon the grounds have been especially designed for the scientific work to be carried on in them.

The buildings still needed, in order to provide in a permanent and worthy way for functions now carried on under temporary conditions, are,—a chapel, a building for the College, a dining hall, an academic theatre, and a building that shall be the headquarters of the social life of the students. A place has been allotted upon the plans for each of these structures. It is hoped that the dining hall will be erected as a Memorial Hall by the alumni of the University. The sum of $59,178.25 has been already subscribed for this purpose.

When the University had determined to move, it was necessary to accomplish the removal as promptly as possible. This involved, unavoidably, the use of its credit. Now that the University has moved it ought to be able to adhere firmly to the safe rule of expanding only as the funds are in hand to provide the means for expansion. Until, therefore, money is given for the erection of the various buildings to which reference has just been made, the University will be obliged to do without them. For a while, this can be endured; but the pressure of the years is certain to make it most desirable, before very long, to have some of these buildings added to our plant. In particular, I should like to see at an early day a permanent and worthy chapel erected for the University. Never within my recollection has the chapel of the University been worthy of its high purpose. I think it would mean much for the religious life of the students if a building could be erected upon the grounds, not only designed as a chapel for religious services, but suitable for all the religious and philanthropic activities that ought to enter into the life of the student body. I shall be glad to confer with anyone who may feel disposed to present to the University any of these buildings.

It is evident, from what has been written, that a great part of the work involved in the transfer of the University from its old site to the new one has been successfully accomplished. The physical transfer has taken place, not only without embarrassment but to the positive advantage of the work of the University. The new buildings are inspiring by reason both of their beauty and of their adaptation to the work to be carried on in them. The ample grounds set off and beautify the buildings. It only remains to overtake the indebtedness which has been incurred as an incident of this removal, and thus to make as short as possible the period during which the further expansion of the University must be held in check. This part of the enterprise continues to call for, as I have no doubt it will receive, the generous help of the public-spirited people of the city.

NAMES FOR THE GROUNDS

An interesting letter appeared in the *Evening Post* last winter, showing that in New England the old word for the college enclosure was "Yard," which still remains in use at Harvard. The word "Campus" seems to have come into use at Princeton. At Columbia, the name, from time immemorial, has been the "Green." The new site is sharply divided, by a retaining wall about 550 feet back from the front line, into two levels of very different grade. The southern plateau has an artificial grade of 150 feet above the Hudson River, and upon it are all the educational buildings. The northern plateau has a natural grade from 25 to 50 feet lower, and is covered, to a great extent, by a fine grove of trees, underneath which is the green sward. I venture to propose that the southern plateau, with its group of educational buildings, be spoken of as the "Quadrangle" ; and that the northern plateau, with its trees and sward, be called the "Green." When the Quadrangle is subdivided, the smaller Quads will naturally be designated by special names, such as the College Quad, the Library Quad, and the like. This will avoid the eminently prosaic usage of speaking of the upper and lower levels, or of the upper and lower plateaus, and will, besides, restore to use our good old Columbia name, the "Green."

DORMITORIES

The time is at hand when the Trustees must determine their policy in regard to dormitories upon the new site. The demand for them, as the sentiment reaches me, is almost universal, both among young and old. Some want them for the sake of what they call college life ; others, for the sake of securing that effect in education that is born of the community of scholars. In my own thought, the problem divides itself into two parts. Columbia offers in its new home opportunities, in many directions, that are not excelled anywhere. Its material plant, being the newest, is, in many respects, the best. Its body of teachers is the largest, in proportion to the numbers taught, to be found in the country ; and there are in the ranks of its teachers not a few men who are masters in their own field. Beyond all this, Columbia is in the city of New York. Such a university, so located, needs only to add cheapness and comfortableness of living to what it already has in order to be thronged with students from all over the land. It is precisely at this point that Columbia's location in New York City confronts it with a difficult problem. Cheapness of living is not unattainable in New York ; but cheapness, combined with convenience of access to the University, and reasonably pleasant conditions of life, upon a scale commensurate to the demand, remains still to be provided. From this point of view, the conditions of the problem can be adequately met, in my judgment, only as all other parallel problems are met in New York City,—by the erection of a large building designed especially for this purpose. The wants of the student are few and simple. He is well content with a small room, if it be clean. Neither does he need costly finish, nor luxuriousness of furniture, in any building which he is to occupy. What he does want is convenience to the University, a clean and well-kept room, plain but good food, and surroundings that lend themselves to study. Approached upon these lines, the problem is much less difficult of solution than that which Mr. Mills has successfully solved for homeless men. I think, also, after very careful investigation, that such a building can readily be made to pay a reasonable interest upon the investment. In my view, everything ought to be done that can be done to make it possible for the young men of the country, after finishing their college course near home, to profit by the university privileges which Columbia and the city of New York afford. I hope, therefore, that the erection of such a building will appeal to the public spirit of men who are glad to unite the accomplishment of a good object with the acquisition of a safe investment.

It is evident, however, that such a building, vitally important as I believe it to be, will not altogether solve our problem, nor fully meet the wishes of those who want dormitories for the sake of their influence upon college life. To secure this result, the dormitories must be upon the Green. They ought to open upon the Green and make that the centre of the community life of the students. It is believed by the architect that four such buildings can be erected upon the Columbia Green without disadvantage to any of the architectural effects which have been produced. Such buildings, in the opinion of the architect, should be placed about 16 feet back from the high fence. They can be designed especially for use as dormitories without embarrassment from their surroundings. On the eastern side of the Green, the buildings would displace a number of good trees. On the western side, they would displace very few. On the whole, I think it must be said that the Green will lend itself quite ideally to the development of this side of the university life. The

Quadrangle, on the other hand, is unsuitable for the purpose, because the buildings already there are out of harmony with any building that would be at all suitable for use as a dormitory. The attempt to place dormitories upon the Quadrangle, therefore, would result either in the erection there of buildings very unsuitable for the purpose, or in marring the harmonious architectural effects which have been so happily secured.

I suppose that dormitories for about 500 students can be built upon the Green. Such a building outside of the grounds as I have spoken of ought to hold about 800 students, although of course it could be constructed in sections. The first equipment alone, in my judgment, could hardly meet the present demand. In five years both together would probably be inadequate. I have discussed these two ways of dealing with the problem because I believe that both must be resorted to, and that neither should be allowed to interfere with the other. In order to clear the way for the erection of dormitories upon the new site, I recommend that the Trustees express their willingness to accept gifts of dormitories to be placed upon the Green. It is evident, from what has been already written, that the University is without funds with which to erect dormitories for itself; but dormitories are a favorite form of gift to other universities, and they are quite likely to be given to us, if the Trustees make known their desire to receive them. It ought to be said, also, that giving in this form would help us as well as in any other to overtake the obligations entered into for the purchase and improvement of this site. If this report should fall under the eye of anyone inclined to give a dormitory to the University or to erect a large building for the students outside of the grounds, I shall be glad to confer with him and to give him all necessary details.

Respectfully,
Seth Low,
President.

APPENDIX

VACANCIES DURING ACADEMIC YEAR 1897–98

By Death

Henry Drisler, LL.D.,	Emeritus Professor of the Greek Language and Literature.
Charles Edwards Colby, E.M., C.E.,	Adjunct Professor of Organic Chemistry.
Edwin M. Kitchel, M.D.,	Assistant in Normal Histology.

By Resignation

William H. Draper, M.D.,	Professor of Clinical Medicine.
Andrew Ernest Foyé, C.E.,	Instructor in Civil Engineering.
Henry E. Keyes, Ph.D.,	Assistant in Physics.
William C. Uhlig, Ph.B.,	Assistant in Analytical Chemistry.
Edwin Chapin Holden, B.S., E.M.,	Assistant in Analytical Chemistry.
Frederick Montgomery Holbrook, E.E.,	Assistant in Mechanical Engineering.

By Expiration of Term

Richard Hoop Cunningham, M.D.,	Demonstrator in Physiology.
Reid Hunt, M.D., Ph.D.,	Tutor in Physiology.
Arthur Pine Van Gelder, Ph.B.,	Tutor in General Chemistry.
Francis Pitt Smith, Ph.B.,	Tutor in General Chemistry.
Norman Wilde, Ph.D.,	Assistant in Philosophy.
Ralph Curtis Ringwalt, A.B.,	Assistant in Rhetoric.
John Angus MacVannel, Ph.D.,	Assistant in Philosophy.
George Balthazar Germann, A.B., Pd.M.,	Assistant in Mathematics.
Ben M. Jaquish, B.S.,	Assistant in General Chemistry.
George Müller, Ph.B.,	Assistant in Analytical Chemistry.
Frederick Spalding Ward, M.D.,	Assistant in Normal Histology.
Frederick Hoole Floy, A.B., M.D.,	Assistant in Normal Histology.
David Joy Greene, C.E., M.E.,	Assistant in Mechanical Engineering.

PROMOTION DURING ACADEMIC YEAR 1897–98

Marston Taylor Bogert, A.B.,	From Tutor in Organic Chemistry To Instructor in Organic Chemistry

PROMOTIONS DATING FROM JULY 1ST, 1898

Herbert Maule Richards, S.D.,	From Tutor in Botany To Instructor in Botany.
Frank Leo Tufts, Ph.D.,	From Assistant in Physics To Tutor in Physics.

CHANGES OF TITLES

Edmund B. Wilson, Ph.D.,	From Professor of Invertebrate Zoölogy To Professor of Zoölogy.
Calvin Thomas, A.M.,	From Professor of the Germanic Languages and Literatures To Gebhard Professor of the Germanic Languages and Literatures.
Alexander B. Johnson, M.D.,	From Clinical Lecturer at Roosevelt Hospital To Clinical Lecturer in Minor Surgery at Roosevelt Hospital.
Ira H. Woolson, E.M.,	From Instructor in Drawing To Instructor in Mechanical Engineering.
William H. Freedman, C.E., E.E.,	From Tutor in Mechanics To Tutor in Electrical Engineering.
William T. Brewster, A.M.,	From Tutor in Rhetoric To Tutor in Rhetoric and English Composition.
George C. D. Odell, Ph.D.,	From Tutor in Rhetoric To Tutor in Rhetoric and English Composition.
Philip Ernest Brodt, A.B.,	From Assistant in Rhetoric To Assistant in Rhetoric and English Composition.
Alfred Louis Kroeber, A.B.,	From Assistant in Rhetoric To Assistant in Rhetoric and English Composition.
William T. Partridge,	From Lecturer in Architecture To Lecturer in Architectural Design.
Watson L. Savage, A.M., M.D.,	From Adviser on Physical Training To Director of the Gymnasium.

APPOINTMENTS DURING ACADEMIC YEAR 1897–98

John Ordronaux, M.D., LL.D.,	Emeritus Professor of Medical Jurisprudence.
Arthur Seymour Vosburgh, M.D.,	Assistant Demonstrator of Anatomy.
George Patten Biggs, M.D.,	Demonstrator of Pathology.
Frederick Hoole Floy, A.B., M.D.,	Assistant in Normal Histology.
William Frederick Neumann, M.D.,	Assistant in Bacteriology.
Charles A. Harper, Ph.D.,	Assistant in Organic Chemistry.
David Joy Greene, C.E., M.E.,	Assistant in Mechanical Engineering.
Wilbur Gregory Hudson, M.E.,	Assistant in Mechanical Engineering.
William Claflin Andrews, E.E.,	Assistant in Physics.
Edward L. Coster,	Assistant in Mechanical Engineering.

APPOINTMENTS DATING FROM JULY 1ST, 1898

William H. Draper, M.D.,	Emeritus Professor of Clinical Medicine.
Earl B. Lovell, C.E.,	Adjunct Professor of Civil Engineering.
Charles Talbot Poore, M.D.,	Clinical Lecturer in Surgery at St. Mary's Free Hospital for Children.
Robert Abbe, M.D.,	Clinical Lecturer in Surgery.
William J. Gies, Ph.D.,	Instructor in Physiological Chemistry.
William K. Simpson, M.D.,	Instructor in Laryngology.
Charles North Dowd, M.D.,	Instructor in Surgery at St. Mary's Free Hospital for Children.
George Montague Swift, M.D.,	Instructor in Medicine at St. Mary's Free Hospital for Children.
John Alexander Mathews, A.M., M.S.,	Tutor in General Chemistry.
Milton C. Whitaker, B.S.,	Tutor in General Chemistry.
Charles O. Townsend, Ph.D.,	Tutor in Botany.
Colin Campbell Stewart, Ph.D.,	Tutor in Physiology.
Alfred Newton Richards, A.B.,	Assistant in Physiological Chemistry.
Henry Edwin McDermott, A.B.,	Assistant in Physiological Chemistry.
Walter Wheeler Cook, A.B.,	Assistant in Mathematics.
Henry Bedinger Mitchell, E.E.,	Assistant in Mathematics.
Walter Taylor Marvin, A.B.,	Assistant in Philosophy.
Richard S. McCaffery, M.E.,	Assistant in Metallurgy.
Leonard Beecher McWhood, A.B.,	Assistant in Music.
Clarence A. McWilliams, M.D.,	Assistant in Normal Histology.
D. Stuart Dodge Jessup, M.D.,	Assistant in Normal Histology.
Daniel Jordan, A.B.,	Assistant in the Romance Languages and Literatures.
John Driscoll Fitz-Gerald, II., A.B.,	Assistant in the Romance Languages and Literatures.
Leon Laizer Watters, B.S.,	Assistant in General Chemistry.
Adam Leroy Jones, Ph.D.,	Assistant in Philosophy.
Russell H. Chittenden, Ph.D.,	Director of the Department of Physiological Chemistry and Lecturer.
Charles Edward Merriam, Jr., A.B.,	Lecturer upon Political Theories.
William A. Anthony, Ph.B.,	Lecturer in Electrical Engineering.
Wellington Putnam,	Lecturer in Rhetoric and English Composition.
Henry Bargy, A.M.,	Lecturer in the Romance Languages and Literatures.
George William Hill, Sc.D., LL.D.,	Lecturer in Celestial Mechanics.
Mortimer Lamson Earle, Ph.D.,	Lecturer in Greek.

RESIDENCES OF STUDENTS

	College.	Law.	Medicine.	Applied Science.	Political Science.	Philosophy.	Pure Science.	Total.
New York City	239	180	382	291	36	53	29	1210
Alabama	1	2	7	....	....	....	....	10
Arkansas	....	....	2	....	....	....	....	2
California	1	4	4	3	1	2	....	15
Colorado	....	6	2	1	....	....	3	12
Connecticut	8	4	32	8	....	2	....	54
District of Columbia	....	....	....	1	1	....	....	2
Florida	....	....	2	....	1	....	....	3
Georgia	2	4	6	2	....	....	....	14
Illinois	....	9	4	1	1	3	1	19
Indiana	1	4	3	1	1	1	....	11
Indian Territory	....	....	1	....	....	....	....	1
Iowa	....	5	....	2	3	3	....	13
Kansas	....	3	2	....	....	1	1	7
Kentucky	....	2	5	....	....	2	1	10
Louisiana	....	....	1	1	....	....	....	2
Maine	1	3	6	....	....	....	....	10
Maryland	....	1	....	1	1	1	....	4
Massachusetts	2	9	15	4	4	4	3	41
Michigan	3	....	3	....	....	1	....	7
Minnesota	....	2	2	1	1	1	....	7
Mississippi	....	....	1	....	....	1	....	2
Missouri	1	3	2	5	....	1	....	12
Montana	....	2	....	1	1	....	....	4
Nebraska	....	....	2	....	....	....	....	2
New Hampshire	....	....	2	1	....	....	....	3
New Jersey	38	27	105	44	4	14	5	237
New Mexico	....	1	....	....	....	....	....	1
New York State*	30	45	96	32	6	9	5	223
North Carolina	....	....	5	1	1	....	1	8
North Dakota	....	1	....	....	....	....	....	1
Ohio	2	12	7	7	5	1	3	37
Oklahoma Territory	....	1	....	....	....	....	....	1
Oregon	1	2	....	....	....	....	....	3
Pennsylvania	1	14	13	7	6	5	1	47
Rhode Island	....	3	5	....	....	2	....	10
South Carolina	....	1	....	....	1	....	....	2
Tennessee	....	2	2	2	1	2	....	9
Texas	....	1	3	2	....	2	1	11
Utah	....	1	....	1	....	....	2	5
Vermont	2.	1	7	....	1	2	2	13
Virginia	1.	3	6	....	1	....	....	10
Washington	....	3	....	....	....	1	....	4
West Virginia	....	....	2	1	1	....	....	4
Wisconsin	....	2	7	1	2	1	....	13
Wyoming	....	....	....	....	1	....	....	1
	334	363	744	422	81	115	58	2117

* Exclusive of New York City.

FOREIGN COUNTRIES

	College.	Law.	Medicine.	Applied Science.	Political Science.	Philosophy.	Pure Science.	Total.
Brought forward	334	363	744	422	81	115	58	2117
Asia Minor			1					1
Austria			1					1
Canada	1	1	5			2	1	10
Cuba		1	2	2				5
Hawaii			3					3
Hungary			1			1		2
Ireland			1					1
Japan			1		2			3
Mexico				2				2
Nova Scotia						1		1
Persia			1					1
Russia		1	3	1				5
Scotland		1						1
South Africa				1				1
Spain				1				1
Switzerland						1		1
Turkey						1		1
	335	367	763	429	83	121	59	2157

PARENTAGE OF DEGREES

Adelbert College, O.	4
Alabama Polytechnic Institute	2
Albion College, Mich	3
Alfred University, N. Y	3
Allegheny College, Pa.	1
Amherst College, Mass	21
Amity College, Ia.	1
Bates College, Me	5
Beloit College, Wis.	1
Bethel College	1
Blackburn University, Ill	2
Bowdoin College, Me	2
Brooklyn Polytechnic Institute	10
Brown University, R. I.	17
Buchtel College, O.	1
Bucknell University, Pa	1
Butler University, Ind	1
Centre College, Ky	1

Christian Brothers College, Mo	1
Citadel Academy, S. C	1
Colby University, Me	1
Colgate University, N. Y	6
College of the City of New York	88
College of Pharmacy, N. Y	16
Columbia University, N. Y	136
Cornell College, Ia	3
Cornell University, N. Y	8
Cumberland University, Tenn	4
Curry University	1
Dalhousie College	1
Dartmouth College, N. H	5
Davidson College, N. C	1
Dickinson College, Pa	3
Drake University, Ia	1
Drew Theological Seminary, N. J	1
Earlham College, Ind	2
Emory College, Ga	3
Eureka College, Ill	1
Fordham College	1
Franklin College	1
Franklin and Marshall College, Pa	4
General Theological Seminary, N. Y	1
Georgetown College, Ky	1
Georgetown University, D. C	1
Hamilton College, N. Y	4
Hanover College, Ind	2
Harvard University, Mass	73
Haverford College, Pa	2
Highland University, Kan	1
Hobart College, N. Y	8
Holy Cross College, Mass	5
Illinois College	1
Illinois Wesleyan University	2
Indiana University	1
Iowa University	1
Iowa Wesleyan University	1
Johns Hopkins University, Md	6
Kenyon College, O	1

Keystone Normal School	1
Knox College, Ill	1
Lafayette College, Pa	4
Lake Forest University, Ill	1
Lebanon Valley College, Pa	1
Leland Stanford Junior University, Cal	12
Lenox College, Ia	1
Lincoln University	2
Louisville High School, Ky	1
McMinnville College, Ore	1
Manhattan College, N. Y	9
Marietta College, O	2
Maryland Agricultural College	1
Massachusetts Institute of Technology	2
Miami University, O	1
Middlebury College, Vt	1
Millsop College, Miss	1
Mt. St. Mary's College, Md	2
National University, D. C	2
New Hampshire College of Agriculture	1
New York University	12
Northwestern University, Ill	1
Notre Dame University, Ind	1
Oberlin College, O	4
Ohio State University	2
Ohio Wesleyan University	2
Otterbein University, O	1
Parsons College, Ia	1
Penn College, Ia	1
Pennsylvania Military College	2
Princeton University, N. J	57
Rensselaer Polytechnic Institute, N. Y	2
Ripon College, Wis	1
Roanoke College, Va	5
Rutgers College, N. J	10
St. Francis Xavier College, N. Y	21
St. John's College, Md	1
St. John's College, N. Y	2
St. Lawrence University, N. Y	2
St. Peter's College	1

St. Stephen's College, N. Y	2
Seton Hall College, N. J	5
Shurtleff College, Ill	1
Southwestern University, Tex	1
State Normal College, N. Y	2
State University of Iowa	1
Stevens Institute of Technology, N. J	1
Swarthmore College, Pa	2
Syracuse University, N. Y	2
Trinity College, Conn	15
Trinity College, N. C	1
Trinity University, Tex	1
Tulane University, La	2
Union College, N. Y	3
University of Alabama	3
University of Buffalo	2
University of California	1
University of Chicago	4
University of Cincinnati	3
University of Georgia	3
University of Illinois	1
University of Kansas	3
University of Kentucky	1
University of Louisville, Ky	1
University Medical College, Kan	1
University of Michigan	10
University of Minnesota	7
University of Missouri	2
University of Nebraska	1
University of North Carolina	2
University of North Dakota	1
University of Pennsylvania	3
University of Rochester, N. Y	7
University of Tennessee	1
University of Texas	2
University of Utah	2
University of Vermont	8
University of Virginia	3
University of Wisconsin	9
Vanderbilt University, Tenn	4

Wabash College, Ind.	2	
Washington College	1	
Washington and Jefferson College, Pa	2	
Washington University, Mo	1	
Wesleyan University, Conn	8	
West Virginia Conference Seminary	1	
West Virginia University	1	
Whitworth College, Wash	1	
Williams College, Mass	24	
Wittenberg College, O	2	
Wofford College, S. C.	1	
Wooster University, O	1	
Worcester Polytechnic Institute, Mass	1	
Yale University, Conn	77	
		900

Foreign Institutions:

Anatolia College, Asia Minor	1	
Edinburgh University, Scotland	2	
Gymnasium of Odessa, Russia	1	
McGill University, Canada	2	
Munich Polytechnic High School, Germany	1	
Oroomiah College, Persia	1	
Queens University, Canada	1	
Trinity College, Canada	1	
University of France	1	
University of Halle, Germany	1	
University of Havana, Cuba	4	
University of Lausanne, Switzerland	1	
University of New Brunswick, Canada	2	
University of Ontario, Canada	1	
University of Oxford, England	1	
University of Santiago de Cuba	1	
University of Sorbonne, France	1	
University of Toronto, Canada	5	
		28

Institutions		Degrees	928
American	151	Students holding more than one degree	123
Foreign	18		
Total	169	Total students holding degrees	805

LECTURES

The following public lectures were delivered during the academic year 1897–98:

In Room 309, Havemeyer Hall, a lecture by George H. Darwin, LL.D., December 10th, on

THE HISTORY OF THE EARTH AND THE MOON.

In Room 305, Schermerhorn Hall, five lectures on Tuesday afternoons:

March 1. Die Einwanderungsfrage in Amerika. Dr. Joseph H. Senner.
" 8. Schiller's Lied von der Glocke. Rev. Dr. Gustav Gottheil.
" 15. Das moderne deutsche Drama. Mr. Isidor Keller.
" 22. Die Bühne. Mr. Heinrich Conried.
" 29. Zwei oesterreichische Dichter: Franz Grillparzer und Anastasius Grün. Mr. Louis von Eltz.

In Room 301, Havemeyer Hall, a lecture by Dr. Maurice Bloomfield, March 11th, on

THE ATHARV-AVEDA.

In Room 309, Havemeyer Hall, two lectures by Professor René Doumic:

March 17. La Société Française et la Littérature d'Aujourd'hui.
" 19. Le Théâtre d'Alfred de Musset.

In Room 301, Havemeyer Hall, a lecture by the Rev. Yaroo M. Neesan, March 18th, on

LIFE IN PERSIA TO-DAY.

In Room 506, Fayerweather Hall, a lecture by Professor A. V. Williams Jackson, March 25th, on

THE RĀMAYANA AND SANSKRIT EPIC POETRY.

In Room 309, West Building, a lecture by Professor Alfred Remy, April 1st, on

THE MUSIC OF INDIA.

In Room 305, Schermerhorn Hall, four lectures by Professor Adolphe Cohn on Wednesday evenings, on

VOLTAIRE.

April 13. The True Significance of Voltaire's Career; his Early Life; English Influences.
(1694–1732.)
" 20. The Apostle of Truth.
(1732–1758.)
" 27. The Apostle of Liberty; the Weapons.
(1758–1776.)
May 4. The Apostle of Liberty; the Results.
(1776–1778.)

In Room 305, Schermerhorn Hall, a lecture by Mr. Frederick Jones Bliss, May 2d, on

RECENT ARCHÆOLOGICAL RESEARCH IN PALESTINE.

In Room 309, Havemeyer Hall, two lectures by Professor Percy Gardner:

May 12. Archæology in Relation to History.
" 13. Some Greek Portraits.

In Schermerhorn Hall, February 28th, March 2d, 7th, 9th, four lectures under the auspices of the Department of Zoölogy, by Dr. Franz Boas, on

THE STATISTICAL STUDY OF VARIATION.

In Room 305, Schermerhorn Hall, on Thursday afternoons, a number of lectures were given under the auspices of the Department of the Romance Languages and Literatures.

At the American Museum of Natural History, three lectures on Saturday evenings by Professor James F. Kemp, on

THE FORMATION AND STRUCTURES OF CRYSTALLINE ROCKS.

December 4. The Formation and Structures of Volcanic Rocks or Lavas.
" 11. The Formation and Structures of Granites, Marbles, and Similar Rocks.
" 18. The Rocks and Minerals of the Greater New York and Vicinity.

At the American Museum of Natural History, four lectures on Saturday evenings, on

MINING.

January 8. Mining, Ancient and Modern. Mr. John A. Church.
" 15. Mining of Low-Grade Ores. Prof. Henry S. Munroe.
" 22. Mining at Lake Superior. Mr. J. Parke Channing.
" 29. Mining Laws. Dr. R. W. Raymond.

At the American Museum of Natural History, four lectures on Saturday evenings, on

ELECTRICAL ENGINEERING.

February 5. Mechanical Sources of Energy. Prof. Frederick R. Hutton.
" 12. Generation of Electrical Energy. Prof. Francis B. Crocker.
" 19. Transmission of Electrical Energy. Dr. A. E. Kennelly.
" 26. Utilization of Electrical Energy. Prof. William A. Anthony.

At the American Museum of Natural History, four lectures on Saturday evenings:

March 5. Some Features of Modern Bridge Construction. Prof. William H. Burr.
" 12. Recent Campaigns in the Soudan. Mr. Henry G. Prout.
" 19. Masonry. Mr. George S. Morison.
" 26. The Development of the Steamship. Mr. Horace See.

At the American Museum of Natural History, a lecture by Professor René Doumic, April 21st, on

LE RÔLE SOCIAL DE L'ÉCRIVAIN.

At the Metropolitan Museum of Art, three lectures by Mr. Edwin Howland Blashfield, Saturday mornings, on

THE DECORATIVE PAINTING OF THE ITALIAN RENAISSANCE AND ITS MODERN LESSONS.

December 4. Introductory.
" 11. The Early Renaissance.
" 18. The Renaissance at its Height.

At the Metropolitan Museum of Art, four lectures by Mr. Louis Fagan, Saturday mornings, on

THE BRITISH MUSEUM AND EUROPEAN PICTURE GALLERIES.

January 8. Greek and Græco-Roman Antiquities.
" 15. Wood-engraving. From its origin to the 16th century.
" 22. Mezzotint Engraving. (After Sir Joshua Reynolds.)
" 29. The Hague and Amsterdam Galleries. (Dutch and Flemish Schools.)

At the Metropolitan Museum of Art, four lectures by Professor John C. Van Dyke, Saturday mornings, on

PICTURE MAKING AND PICTURE JUDGING.

February 5. The Picture as Decoration.
" 12. The Picture as Illustration.
" 19. The Picture as Representation.
" 26. The Picture as Expression.

At the Metropolitan Museum of Art, four lectures by Professor George F. Comfort, Saturday mornings, entitled

DISCUSSIONS IN ESTHETIC CRITICISM.

March 5. What is Art?
" 12. Fallacy of "Art for Art's Sake."
" 19. Fashion and Art.
" 26. Relation of Patronage to Art.

In the Great Hall, Cooper Union, four lectures by Mr. Charles Sprague Smith, Tuesday evenings, on

OLD NORSELAND.

December 7. Wanderings in Old Norseland, Iceland, the Faroes, the Orkneys, Shetland, and the Hebrides.
" 14. Iceland, the central seat of the Old Norse civilization during the Heroic Age, its discovery, settlement, and the rise and fall of the free state.
" 21. Old Norse Literature, the Sagas, the Poetry.
" 28. The Norse discovery of "Vinland the Good" (America).

In the Great Hall, Cooper Union, four lectures by Dr. E. R. L. Gould, Tuesday evenings, on

LIVE SOCIAL PROBLEMS OF CITIES.

January 4. Better Hours for City Wage-Earners.
" 11. Recreation as a Factor in Social Progress.
" 18. The Care of the Unemployed.
" 25. The Liquor Problem. Its Effective Treatment.

In the Great Hall, Cooper Union, four lectures by Mr. James E. Learned, Tuesday evenings, on

SIR WALTER SCOTT.

February 1. Family Relations. Early Years. School and College. Professional Studies. Call to the Bar. First Publication. Marriage. Lasswade. Sheriff of Selkirkshire. The "Border Minstrelsy." "Sir Tristram." Ashestiel. "The Lay of the Last Minstrel." Engagement with Ballantyne. "Life of Dryden." Clerk of the Court of Session.
" 8. Rising Fame. "Marmion." Quarterly Review. "The Lady of the Lake." "Vision of Don Roderick." Abbotsford. "Rokeby." "The Bridal of Triermain." Business Distresses. The Laureateship. "Waverley." Northern Journey. "The Lord of the Isles." "Guy Mannering." Waterloo. "The Antiquary." "Tales of my Landlord."

February 15. Illness. Washington Irving. "Rob Roy." "The Heart of Midlothian." Abbotsford increasing. Baronetcy. "The Bride of Lammermoor." "Legend of Montrose." Domestic affliction. "Ivanhoe." University Honour. "The Monastery." "The Abbot." Guesses at the Author of "Waverley." "The Pirate." "The Fortunes of Nigel." The King's Visit. A Dire Physical Portent. "Peveril of the Peak." "Quentin Durward." "St. Ronan's Well." "Redgauntlet." Abbotsford finished. "Tales of the Crusaders." Irish journey.

" 22. "Life of Napoleon." Business Complications. Suspense. Ruin of Sir Walter's Fortunes. His Resolution. Surrender of his Property. Unparalleled labors. "Woodstock." Death of Lady Scott. Manner of work. "Life of Napoleon." "Chronicles of the Canongate." "Tales of a Grandfather." "Fair Maid of Perth." "Anne of Geierstein." Apoplexy and its Results. Clerkship Resigned. Foreign journey. Renewed Illness. Return to Abbotsford. Death. Review.

In the Great Hall, Cooper Union, five lectures by Hamilton W. Mabie, L.H.D., Tuesday evenings:

March 1. A Great Man of Letters.
" 8. The Education of the Hero.
" 15. Society and Literature in America.
" 22. Education and Business.
" 29. Literature as a Personal Resource.

GIFTS RECEIVED DURING ACADEMIC YEAR 1897–98.

National Society of the Sons of the American Revolution,
Gift of a tablet commemorating the battle of Harlem Heights.

W. W. Allis, of Milwaukee, Wis.,
Gift of the equipment of a Laboratory of Steam Engineering, at an expense of about $15,000, as a memorial of his father, the late Edward P. Allis, of New York, to be known as the "Allis Steam Engineering Laboratory."

Joseph S. Curtis,
Gift of a set of fifty specimens representing the important ores of Johannesburg, Africa.

Charles F. McKim,
Gift of a statue of Euripides.

George G. Wheelock, Class of 1864 (P. and S.),
Gift of a statue of Sophocles.

F. Augustus Schermerhorn, Class of 1868 (S. of M.),
Gift of a statue of Augustus Cæsar.

W. Bayard Cutting, Class of 1869,
Gift of a statue of Demosthenes.

William C. Illig, Class of 1882 (S. of M.),
Bequest of $2000. "The said sum to be invested and the annual income thereof to be applied to the purchase of a prize or prizes (which may, in the discretion of the Faculty, take the form of money, medal or medals, book or books, or other appropriate articles) to be awarded to the student or students (as the Faculty may determine) of the graduating or fourth class of said School of Mines who shall, in the judgment of the Faculty, have merited the same by commendable proficiency in such scientific subject or subjects as the Faculty may designate. The said prize or prizes, medal or medals, to be suitably inscribed or engraved, and to be known as the Illig Prize, or Illig Medal, as the case may be."

Miss Catherine W. Bruce,
Gift of $1600 to be used in the employment of computers in the Astronomical Observatory.

Jones and Lamson Machine Company,
Gift of a flat turret lathe with outfit.

Otis Elevator Company,
Gift of an experimental elevator, installed in the Engineering Building.

Babcock and Wilcox Company,
Gift of two wrought-steel water-tube boilers for the Power House.

Frederick R. Hutton, Class of 1873 (S. of M.),
Gift of pastel portraits of Francis L. Vinton, E.M., Professor of Mining Engineering, 1864–77, and of William P. Trowbridge, Ph.D., LL.D., Professor of Engineering, 1877–92.

New Jersey Zinc Company,
Gift of a model of zinc ore at Franklin Furnace, N. J.

Samuel Sloan,
Gift of several boxes of fossil plants from the coal regions.

Joseph F. Loubat (Duc de Loubat),
Deed of the premises Nos. 503–511 Broadway, and 74–82 Mercer Street, valued at $1,100,000, subject to an annuity of $60,000 during the life of the grantor, upon condition that the premises or the proceeds constitute a fund to be known as the "Gaillard-Loubat Library Endowment Fund," and that the rents, income, and interest derived from such fund be applied solely to and for the use, support, maintenance, and increase of said Library, and for no other use or purpose whatsoever.

J. Ackerman Coles, Class of 1864,
Gift of bronze busts of Homer and Æsculapius, and a reproduction of the statue known as "The Dying Gaul."

Baldwin Locomotive Works (Burnham, Williams, & Co.),
Gift to the Department of Mechanical Engineering of the locomotive "Columbia," valued at $10,000, which was exhibited at the Chicago Exposition in 1893.

F. Augustus Schermerhorn, Robert Schell, John Stanton, and Sumner Hollingsworth,
Subscriptions amounting to $2300 for the purpose of installing the locomotive "Columbia" in the Mechanical Laboratory.

Melville W. Mix, President, Dodge Manufacturing Co.,
Gift of machinery and appliances for the transmission of power, valued at $2000, as a memorial of Wallace H. Dodge.

Horatio J. Brewer, Mrs. James Herbert Morse, Miss Elizabeth Blake, Mrs. Isaac N. Seligman, Samuel Colman, Robert H. Robertson, Mrs. G. L. Cheney, and E. Francis Hyde, Committee, and others:
Gift of $7500 for the endowment of a Fellowship in Music, to be known as the Joseph Mosenthal Fellowship in Music, to be awarded at least every second year to the best qualified candidate, man or woman, devoting himself to the study of musical composition at Columbia University or elsewhere, in this country or abroad.

Shaw Electric Crane Company,
Gift to the Museum of the Department of Mechanical Engineering of a complete electric crane.

J. G. Brill Company,
Gift to the Department of Mechanical Engineering of a completely equipped electric street car with truck and fittings.

William C. Schermerhorn, Class of 1840,
Gift of $750 for salaries.

A Friend of the College,

Gift of a special fund for American History	$ 900
For purchase of lantern slides, Department of History	100
	$1,000

A Friend of the College,

Gift of Special Library Fund, 1898	$7,500
For salaries, 1898–99	2,500
	$10,000

Rev. E. A. Hoffman, D.D.,
Gift for salaries, Department of Oriental Languages, 1898–99.......... $250

Seth Low, Class of 1870,
Gift for salaries, Department of Oriental Languages, 1898–99.......... $250

James Loeb,
Gift of $50, to be used in subscribing for labor papers of the United States, for the Department of Economics and Social Science.

Seth Low, Class of 1870,
Edwin Forbes; Etchings.—Life Studies of the Great Army, by Edwin Forbes, late special artist with the Armies of the Union, and member of the French and London Etching Clubs.

Subscriptions from the following, to provide for the expenses of two lectures by Professor Percy Gardner, of Oxford.

William M. Sloane
Henry F. Osborn
Henry A. Todd
Marvin R. Vincent
Charles E. Pellew
Julius Sachs
Frederic J. de Peyster
William R. Ware
Richmond Mayo-Smith
Clarence H. Young
Harry T. Peck
E. R. A. Seligman
Charlton T. Lewis
Ogden N. Rood
Thomas R. Price
John B. Pine
James R. Wheeler
Nicholas Murray Butler
William P. Prentice
E. D. Perry

The Wawepex Society (John H. J. Stewart, Scribe),
Gift of $225, to establish a scholarship and to provide for an investigator's table in the School of Biology at Cold Spring Harbor during the summer of 1898.

J. & F. Kesseler,
Gift to the Mineralogical Museum of a polished slab of Onyx Marble. California.

A. M. Ryon, Class of 1886 (S. of M.),
Gift to the Mineralogical Museum of Gypsum on mine timber. Montana.

W. B. Devereux, Class of 1878 (S. of M.),
Gift to the Mineralogical Museum of Krennerite crystals, Colorado ; Dolomete, California.

E. E. Olcott, Class of 1874 (S. of M.),
Gift to the Mineralogical Museum of Large Huantajayite. Chili.

James F. Kemp, Class of 1884 (S. of M.),
Gift to the Mineralogical Museum of Large Beryl, Ackworth, N. H., and other specimens.

Roy Hopping,
Gift to the Mineralogical Museum of Marshite and Raspite, new Australian minerals.

L. Kahn,
Gift to the Mineralogical Museum of Hamlinite and Herdenite, from Maine.

C. N. Fenner, Class of 1892 (S. of M.),
Gift to the Mineralogical Museum of suite of minerals from Paterson, N. J.

Messrs. Chester, Kunz, Colton, Luquer, and Moses, and Professors Ricketts and Cornwall,
Gift of framed life-size portrait of Professor Egleston.

C. W. Hunt,
Gift to the Department of Mechanical Engineering of a Henning Extensometer.

Thomas Almond,
Gift to the Department of Mechanical Engineering of an Almond Coupling.

The Sherwood Manufacturing Company, of Buffalo,
Gift to the Department of Mechanical Engineering of a new form of appliance devised and manufactured by them for the removal of adhering deposits upon the inside of the tubes of steam boilers.

The Payne Engineering Company,
Loan to the Department of Mechanical Engineering of a sample Rites steam-engine governor.

Heinrich Ries, Barnard Fellow,
Gift to the Geological Department of a series of pottery clays, collected in Europe, and of a series of the ores of Aluminum (beauxites) from the south of France.

J. D. Irving, Fellow in Geology,
Gift to the Department of Geology of a large suite of eruptive rocks from Southwestern Colorado, collected by Mr. Irving while on the United States Geological Survey during the summer of 1897, and of a suite of eruptive rocks from the Spanish Peaks in Central Colorado.

W. C. Knight, of the University of Wyoming,
Gift to the Department of Geology of a suite of eruptive rocks from various remote places in Wyoming.

O. A. Kennedy, of Ogden, Utah,
Gift to the Department of Geology of a suite of rocks illustrating the geology of the Wasatch Mountains in Utah.

L. H. Barnett, Class of 1895 (S. of M.),
Gift to the Department of Geology of a suite of ores from the Enterprise Mine, Rico, Colorado.

G. Sessinghaus, Class of 1898 (S. of M.),
Gift of a suite of Leadville ores and rocks.

A. C. Beatty, Class of 1898 (S. of M.),
Gift to the Department of Geology of a suite of ores from Southwest Missouri, from the zuric and lead mines near Joplin. Also a suite of Cripple Creek gold ores.

A. A. Julien,
Gift of a large and valuable collection of rocks to the Department of Geology.

James F. Kemp, Class of 1884 (S. of M.),
Gift of $110 to the Department of Geology for defraying expense of supplies, freight, etc.

Gilbert van Ingen,
Gift of $15 to the Department of Geology for defraying expense of supplies, freight, etc.

Arthur Hollick,
Gift of $10 to the Department of Geology for defraying expense of supplies, freight, etc.

A Friend of the University,
Gift of $500 to the Department of Sociology towards the establishment of a complete collection of documents, reports, maps, charts, and photographs illustrative of social conditions and progressive social activity in New York City.

Ingersoll-Sergeant Drill Company,
Gift to the Department of Mechanical Engineering of a compound steam air-compressor.

E. S. Cook, Pottstown, Pa.,
Gift to the Department of Metallurgy of a suite of pig-iron samples.

E. L. Ford, Youngstown Steel Co., Youngstown, Ohio,
Gift to the Department of Metallurgy of specimens of washed metal.

O. M. Hartzell & Co., Pittsburg, Pa.,
Gift to the Department of Metallurgy of a suite of rare metallurgical specimens.

R. E. Jennings, West Bergen Steel Works, Jersey City, N. J.,
Gift to the Department of Metallurgy of twenty bars of special iron and steel.

N. Lilienberg, New York City,
Gift to the Department of Metallurgy of a large and valuable suite of iron and steel specimens, at least seventy-five pieces, with a Wiborgh pyrometer and Caspersson's testing table.

W. B. Middleton, Taylor Iron and Steel Co., High Bridge, N. J.,
Gift to the Department of Metallurgy of a car wheel, fractured to show structure.

R. G. G. Moldenke, Pittsburg, Pa., Class of 1885 (S. of M.),
Gift to the Department of Metallurgy of twenty specimens of white-iron castings.

Nichols Chemical Company, Laurel Hill, N. Y.,
Gift to the Department of Metallurgy of one barrel of copper ore, from the Nichols Chemical Company.

Park and Lacy Company, San Francisco, Cal.,
Gift to the Metallurgical Department of eight blue prints of metallurgical apparatus and works.

Thomas D. West, Sharpsville, Pa.,
Gift to the Department of Metallurgy of eighteen pecial barss of cast iron.

H. de Valliere, New York City,
Gift to the Department of Metallurgy of two bags of magnesite.

E. J. Riederer, New York City,
Gift to the Department of Metallurgy of a suite of Agordo ores.

C. B. Dudley, Altoona, Pa.,
Gift to the Department of Metallurgy of a suite of cast-iron cutting tools.

Illinois Steel Company,
Gift to the Department of Metallurgy of a collection of bound and mounted photographs.

Davidson H. Smith,
Gift to the Department of Physics of a large complete Columbia Graphophone, with equipments.

Andrew H. Smith, New York City,
Gift to the Department of Physics of a large double-plate Holtz Electrical Machine, with numerous terminals, jars, and attachments.

A Friend of the University,
Gift to the Department of Sociology for equipment of $500.

E. C. Seguin, Class of 1864 (P. and S.),
Gift to the Department of Pathology of a valuable collection of books, scientific apparatus, and pathological specimens.

C. J. Farrell,
Gift to the Department of Civil Engineering of photographs of the Harlem River Driveway and Baltimore Tunnel.

New Jersey Steel and Iron Company,
Gift to the Department of Civil Engineering of blue-print plans of steel frames of three buildings.

Pencoyd Bridge Company,
Gift to the Department of Civil Engineering of two sets of blue prints of railroad plate girders.

Carnegie Steel Company, Limited,
Gift to the Department of Civil Engineering of thirty-nine sections of rolled-steel shapes.

Through Edward A. Darling, Superintendent of Buildings and Grounds,
Gift to the Department of Civil Engineering of a Fairbanks Cement Testing Machine.

T. B. Peck, Jr.,
Gift to the Department of Music of a photograph of Verdi.

J. Ackerman Coles, Class of 1864,
Gift of bronze statuette of the "Farnese Bull," with pedestal.

Through Samuel A. Tucker, Instructor in Industrial Chemistry,
Gift to the Department of Chemistry of $2665 for the purchase of apparatus and instruments for the Industrial Laboratory, as follows:
A set of steam evaporators.
Two large steam water baths.
High-pressure steam fittings throughout the laboratory.
Medium-sized water bath.
Steam-heated drying closet for dyed samples.
Brown and Sharpe yarn reel.
Autoclave.
Johnson filter press.
Three centrifugals.
Large copper still with condensing worm.
Medium-sized copper still with mechanical stirrer and condensing worm.

Steam bath for steaming calico samples.
Lathe.
Five-horse-power motor.
Shafting, pulleys, etc.
Crucible furnace, and the expense of setting up the above.

Through of Professor Charles F. Chandler,
Gift to the Department of Chemistry of $4520.20 for part of the equipment of the Chemical Laboratories.

William J. Mathiesen & Company,
Gift to the Department of Chemistry of 152 samples of coal-tar colors, and a collection of pamphlets and recipes illustrated with dyed samples.

Frederick Bayer & Company,
Gift to the Department of Chemistry of 182 samples of coal-tar colors, and a collection of pamphlets and recipes illustrated with dyed samples.

Pickhardt & Kuttroff,
Gift to the Department of Chemistry of 151 samples of coal-tar colors, and a collection of pamphlets and recipes illustrated with dyed samples.

Victor Koechl & Company,
Gift to the Department of Chemistry of sixteen chemicals for producing insoluble coloring matters in fabrics.

The Oakes Manufacturing Company,
Gift to the Department of Chemistry of a large collection of natural dyestuffs.

Albert E. Gallant, Class of 1890 (P. and S.),
Gift to the Department of Chemistry of a quantity of boiled-off liquid for silk dyeing.

The Ammonal Chemical Company,
Gift to the Department of Chemistry of a complete set of ammonal preparations to illustrate the manufacture of synthetic drugs.

Charles H. Jenks,
Gift to the Department of Chemistry of a fine specimen of massive corundum from the Corundum Hill Mine, Macon Co., N. C.

Fries Brothers,
Gift to the Department of Chemistry of a very complete collection of synthetic perfumes.

Edward R. Squibb,
Gift to the Department of Chemistry of a large and handsome specimen of crystallized milk sugar.

Lewisohn Brothers,
Gift to the Department of Chemistry of $200 for the purchase of books on analytical chemistry, for use in the study-room connected with the laboratories.

Through W. H. Meadowcroft, of the Edison Company, and generosity of some friends,

Gift to the Department of Chemistry of a five-horse-power motor for use in the Assay Laboratory in operating the new gas-furnace plant and the machinery for pulverizing ores. The total cash payments for the motor amounted to $202.22, although the value of the machinery is nearly double.

Gifts to the Department of Chemistry of subscriptions, amounting to $101.82, for the purchase of journals, special books, and periodicals for the students' study-room of the Department of Chemistry.

STUDENTS OF THE UNIVERSITY IN THE ARMY OR NAVY DURING THE WAR WITH SPAIN.

COLLEGE.

(Fourth Year.)	Frank Holmes Curry, Auxiliary Navy.
“ “	John Fulton Berrien Mitchell, Jr., 2d Lieutenant, Regular Army.
“ “	Jacob Smith Schlussel, Auxiliary Navy.
(Second Year.)	William Underhill Moore, 71st Regt., N. Y. Inf. Vols.
“ “	Daniel D. Rosenberg, 14th Regt., N. Y. Inf. Vols.
(Special.)	Henry Lehman Weil, Auxiliary Navy.

LAW.

(Second Year.)	Henry N. Arnold.
“ “	Fritz Wilhelm Hoeninghaus, Squadron A.
“ “	John Henry Iselin, Squadron A.
“ “	Louis Rosett, Corporal, 9th Regt., N. Y. Inf. Vols.
“ “	Morton Stein, 14th Regt., N. Y. Inf. Vols.
(First Year.)	Amos Richards Eno Pinchot, Squadron A.
“ “	Frank Edward Stripe.

SCHOOL OF MEDICINE.

(First Year.)	Harry A. Bubb, Military Duty in Pennsylvania.
“ “	Carl Fulda, 2d Div., 2d Naval Battalion, N. Y.
“ “	Arthur J. Schneidenbach, Seaman, U. S. S. *Nahant*.

(First Year.)	Samuel Meredith Strong, Navy, New Rochelle, N. Y.
(Second Year.)	Ralph A. Hayt, Private in Hosp. Corps, U. S. A.
" "	Henry Suydam Satterlee, Private, Squadron A.
" "	Raymond Sidney Bamberger, Private, 12th Regt., Hosp. Corps, N. G., N. Y.
" "	Lester L. Roos, Private, Co. E, 9th Regt., N. G., N. Y.
" "	Maurice H. Krebs, Private, 71st Regt., Co. B, N. G., N. Y.
" "	William de F. Ireland, Hosp. Corps, 12th Regt., N. G., N. Y.
(Third Year.)	Jonathan M. Wainwright, Captain, 1st Regt., Conn. N. G.
" "	Edward A. Aronson, Private, 8th Regt. Infantry, N. G., N. Y.
" "	Arthur M. Line, Private, Squadron A.
(Fourth Year.)	Maynard Gooding Burgess, Assistant Surgeon, U. S. A.
" "	Samuel J. Kopetsky, Hosp. Steward, 8th Regt. Infantry, N. G., N. Y.
" "	George W. Lindheim, Corporal, 8th Regt. Infantry, N. G., N. Y.
" "	William P. Earl, 31st Separate Company, N. G., N. Y.
" "	Archibald Henry Busby, Hosp. Corps, 71st Regt., N. G., N. Y., Acting Apothecary.
" "	Emil A. Müller, 1st Nav. Bat., N. Y., U. S. S. *New Hampshire.*
" "	Letchworth Smith, Military Duty.
(Old Curriculum.)	Thomas A. Rothwell, Co. A, 22d Regt., N. G., N. Y.

SCHOOLS OF APPLIED SCIENCE.

(Fourth Year.)	Louis Floro Chibas, Cuban Army.
" "	Charles Sidney Haight, Squadron A. Later received commission as Lieutenant in the Infantry.
" "	William Tudor, Jr.

(Third Year.)	Philander Hanford Godwin, Auxiliary Navy.
“ “	Henry Howison Henderson, Quartermaster, Auxiliary Navy.
“ “	Rhinelander Waldo, 12th Regt., N. Y. Inf. Vols.
(Second Year.)	Orleans Longacre, Jr., Chief Quartermaster, Auxiliary Navy.
“ “	Edward Washburn Rogers, Gunner's Mate, the Auxiliary Navy.
“ “	Otto Wagner, Auxiliary Navy.
(First Year.)	Arthur DeWitt Brittingham, Auxiliary Navy.
“ “	Bradford Darrach, Jr., Auxiliary Navy.
“ “	Moreton Reginald Thompson, Auxiliary Navy.
“ “	Arthur Dudley Underhill, Engineer Corps.

COLUMBIA UNIVERSITY RED CROSS AUXILIARY SOCIETY.

COMMITTEE

Chairman, Mrs. Seth Low.
Treasurer, Mrs. Munroe Smith.
Secretary, Mrs. Francis M. Burdick.
Miss Emily James Smith.
Mrs. James E. Russell.

ADVISORY BOARD

President Low,
Bishop Potter,
Mr. John B. Pine,
Mrs. A. A. Anderson,
Miss Grace H. Dodge,
Professor Van Amringe,
Dr. Geo. S. Huntington,
Mr. V. Everit Macy.

COLUMBIA COLLEGE

REPORT OF THE DEAN

FOR THE ACADEMIC YEAR ENDING JUNE 30, 1898.

To the President of Columbia University
in the City of New York.

SIR:

I beg to submit herewith my report upon the College for the academic year ending June 30, 1898.

The number of students matriculated at the beginning of the year was 327; 14 entered subsequently, making the total number 341, distributed in the several classes as follows:

Seniors	49
Juniors	55
Sophomores	93
Freshmen	108
University students taking one or more courses in the College	6
Special students	30
	341

The ages of the students at the beginning of the year were as in the following table:

AGES OF STUDENTS.

Class.	Number in Class.	Average Age.	Oldest.	Youngest.
Senior	49	21.	36	18
Junior	55	19.7	24	18
Sophomore	93	18.7	28	16
Freshman	108	18.4	46	15
University students	6	20.9	23	18
Special students	30	20.	25	16
	341	19.8	46	15

Number in each class of the following ages:

	Seniors.	Juniors.	Sophomores.	Freshmen.	University Students.	Specials.
Between 15 and 16	..	..	..	5	..	..
“ 16 and 17	..	..	3	9	..	2
“ 17 and 18	..	5	14	34	..	3
“ 18 and 19	3	13	28	31	1	4
“ 19 and 20	14	14	30	18	1	4
“ 20 and 21	15	14	9	5	1	9
“ 21 and 22	6	5	7	2	1	3
“ 22 and 23	4	1	1	2	1	..
“ 23 and 24	4	2	..	..	1	3
“ 24 and 25	..	1	..	1	..	1
“ 25 and 26	..	..	..	..	..	1
“ 26 and 27	2	..	..	..	..	..
“ 28 and 29	..	..	1	..	..	..
“ 36 and 37	1	..	..	..	..	..
“ 46 and 47	..	..	..	1	..	..

The residences of the students were as follows:

Alabama	1
Brooklyn, N. Y.	47
California	1
Connecticut	8
Georgia	2
Maine	1
Massachusetts	3
Michigan	4
Missouri	1
New Brunswick, Canada	1
New Jersey	37
New York City	183
New York State *	44
North Carolina	1
Ohio	2
Oregon	1
Texas	2
Utah	1
Wisconsin	1
	341

Of the students admitted, nineteen were received on certificate from other colleges; seven to the Freshman class from the following institutions: two from Princeton University, New Jersey, and one each from University of

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* Exclusive of the cities of New York and Brooklyn.

Georgia, St. Francis Xavier College, New York, Polytechnic Institute of Brooklyn, Georgetown College, Washington, D. C., and one on Regents' diploma; five to the Sophomore class from the following institutions: two from St. Francis Xavier College, New York, one each from New York University, Trinity College, Hartford, Connecticut, and the Southern University, Alabama; three to the Junior class from the following institutions: one each from the College of the City of New York, New York University, and Georgetown College, Washington, D. C.; four to the Senior class from the following institutions: two from the College of the City of New York, and one each from New York University and the University of Michigan.

Of the members of the Freshman class, fifty-one were admitted provisionally—that is, with entrance conditions to fulfil. Such students are held under probation till the end of the first half-year. Just prior to the close of the probationary period, the Committee on Entrance Examinations, in conjunction with the Dean, consider the special reports made by heads of departments in the case of each conditioned student, and determine whether he is to be admitted to full standing, have his period of probation extended, or be dropped from the roll.

Under this provision, fourteen were advanced to full standing at the end of the first term; thirty-two had their period of probation extended until the beginning of the next academic year, and five were dropped from the roll. Four members of the Sophomore class, five of the Freshman class, and four special students retired from College during the year.

Forty-one members of the Senior class, and one "belated" Senior, satisfied all the requirements for the baccalaureate degree. Two members of the graduating class, Messrs. Frank Holmes Curry and Jacob Smith Schlussel, enlisted for United States service in the Second Naval Battalion of New York, and were ordered on duty. The records of both of them, up to the time of their departure, were such as to warrant the belief that, had they continued their studies, they would have satisfactorily completed their college course. Under the resolution of the University Council, adopted April 19, 1898, relating to "students of the graduating classes in the College and in the various Schools of the University, who, by reason of membership in the National Guard, or in the Naval Reserve, or by reason of enlistment, are obliged to abandon their academic studies," they were recommended for their degree. The forty-four students referred to above had conferred upon them, at the Commencement held on the 8th inst., the degree of Bachelor of Arts.

Six members of the Senior class failed to satisfy the requirements for a degree and were not graduated.

The relations of this College to Barnard College are such that Columbia is responsible for the efficiency and sufficiency of all the courses in that College leading to a degree, and on proper certification grants to students thereof the degree of Bachelor of Arts. It was my duty, therefore, as Dean of this College, to examine with care the courses pursued by the members of the Senior class of Barnard College from the beginning to the end of their academic career. This duty I discharged, and certified to the President that twenty-one members of that class had complied with all the requirements for the baccalaureate degree—and those so certified received that degree at Commencement.

The subjects of study selected by the special students were:

Anthropology	1	Latin	7
Architecture	1	Literature	3
Chemistry	5	Mathematics	5
English	12	Mechanical Engineering	1
French	16	Mechanics	1
Geology	1	Music	1
German	8	Philosophy	6
Greek	2	Physics	5
History	13	Political Economy	5
Italian	1	Rhetoric	21

Of the fifty-five members of the Junior class, one was a "belated" Senior,—that is to say, was required to matriculate as a Junior because of his deficiency in some requirements of that class; of the ninety-three members of the Sophomore class, six were, in the same sense, "belated" Juniors; and of the one hundred and eight members of the Freshman class, nine were, in the same sense, "belated" Sophomores.

Under the "new" curriculum, which went into effect at the beginning of the present academic year, students are classified in three groups according to the topics presented by them for entrance.

Candidates for admission to the Freshman class must pass satisfactory examination in English, elementary mathematics, and Latin, and also in one of the following groups of subjects:

I	II	III
Greek French	Greek German	A natural science with laboratory work (chemistry, physics, or botany), French, German, and advanced mathematics.

The required number of hours of attendance a week for all groups in the Freshman class is fifteen. Of the members of that class, 51 entered in Group I, 44 in Group II, and 13 in Group III. Freshmen in Groups I and II are required to take twelve hours of prescribed studies and one elective course of three hours. In Group I the prescribed studies are: Greek or Latin, elementary German, mathematics, and rhetoric; the elective courses, of which one must be taken, are: chemistry, English, French, Latin, Greek, physics, and history. The choice of electives made by the 51 students in Group I was numerically as follows:

Chemistry	8
French	20
Greek	17
History	4
Physics	2

In Group II the prescribed studies are the same as those in Group I, with the substitution of elementary French for elementary German; and the elective courses are the same with the substitution of German for French. The choice of electives made by the 44 students in Group II was numerically as follows:

Chemistry	4
German	13
Greek	10
History	4
Latin	8
Physics	5

Of the ninety-five Freshmen in Groups I and II, thirty-five continued the study of both Greek and Latin during the year.

Freshmen in Group III are required to take six hours of prescribed studies and three elective courses of three hours each. The prescribed studies are Latin and rhetoric; the elective courses, of which three must be taken, are: chemistry, physics, mathematics, mechanical engineering, English, French, German, and elementary Greek. The choice of electives made by the thirteen students in Group III was numerically as follows:

Chemistry		3
French		10
German		7
Greek		2
History		2
Mathematics (2 courses elected)	10	
Deduct for repetition	2	8
Physics		5

Five took French, Mathematics, and German
One “ “ “ “ Physics
“ “ “ “ “ Greek
“ “ “ “ “ Chemistry
“ “ “ Greek, “ Physics
“ “ “ Physics, “ History
“ “ Mathematics, Chemistry, and History
“ “ “ German, “ Physics
“ “ German, Chemistry, and Physics

The required number of hours of attendance a week for the Sophomore class is sixteen. Students in Groups I and II have seven hours of prescribed studies and nine hours of elective; the prescribed studies are: history, rhetoric, and a course in botany, chemistry, physics, or zoölogy. Of the 93 members of the Sophomore class, 4 were in Group III, and the remainder in Groups I and II; of the 89 in Groups I and II, 4 of the students were not required to elect a course in natural science in the Sophomore year; of the remaining 85, 35 took chemistry, 44 took physics, 5 took zoölogy, and 1 took botany; in addition to this the following elections were made:

Botany (1 course elected)		1
Chemistry (3 courses elected)		4
English (3 courses elected)	47	
Deduct for repetition	4	43
French (5 courses elected)		36
Geology (1 course elected)		1
German (6 courses elected)	34	
Deduct for repetition	1	33
Greek (1 course elected)		45
History (4 courses elected)		14
Italian (1 course elected)		1
Latin (3 courses elected)		39
Mathematics (2 courses elected)		29
Mechanical Engineering (1 course elected)		2
Mechanics (1 course elected)		2
Philosophy (1 course elected)		7
Physics (2 courses elected)		12
Political Economy (1 course elected)		6
Rhetoric (4 courses elected)	19	
Deduct for repetition	1	18
Zoölogy (1 course elected)		1

Sophomores in Group III have four hours of prescribed study in history and rhetoric, and twelve hours of elective courses; by the four students in this Group the following elections were made:

Botany (1 course elected)	1
Chemistry (1 course elected)	2
English (1 course elected)	2
French (1 course elected)	1
German (2 courses elected)	3

Latin (1 course elected)	1
Mathematics (1 course elected)	1
Philosophy (1 course elected)	1
Physics (1 course elected)	2
Political Economy (1 course elected)	1
Zoölogy (2 courses elected)	2

Of the fifteen hours a week required of the Junior class, three hours are given to prescribed studies in philosophy and political economy. The remaining twelve hours are given to elective courses.

The following table indicates numerically the elections made among the courses open to Juniors:

Anthropology (2 courses elected)	2	
Deduct for repetition	1	1
Architecture (1 course elected)		1
Astronomy (2 courses elected)		2
Botany (1 course elected)		6
Chemistry (4 courses elected)	34	
Deduct for repetition	1	33
English (3 courses elected)	53	
Deduct for repetition	10	43
French (5 courses elected)	13	
Deduct for repetition	3	10
Geology (2 courses elected)		4
German (8 courses elected)	13	
Deduct for repetition	1	12
Greek (3 courses elected)		5
History (7 courses elected)	26	
Deduct for repetition	3	23
Indo-Iranian (1 course elected)		1
Italian (1 course elected)		2
Latin (3 courses elected)		8
Mathematics (2 courses elected)		5
Mechanical Engineering (1 course elected)		1
Mechanics (2 courses elected)		7
Mineralogy (2 courses elected)	2	
Deduct for repetition	1	1
Philosophy (4 courses elected)		8
Physics (2 courses elected)		10
Political Economy (1 course elected)		1
Psychology (3 courses elected)		3
Rhetoric (5 courses elected)	47	
Deduct for repetition	12	35
Spanish (1 course elected)		2
Zoölogy (2 courses elected)		10

The studies of the Senior year are wholly elective, and cover a wide range. In addition to courses offered in philosophy, philology, and letters, in pure science, in history and political science, the first-year courses in the Schools of Applied Science, Medicine, and Law are open to members of the Senior class who became students of the College not later than the beginning of their Junior year, and such as may desire to do so can prepare themselves for advanced standing in those schools by electing these first-year courses, as a whole or in part, and counting them for the degree of Bachelor of Arts.

The elections made by members of the Senior class are as in the following statement:

In Philosophy, Philology, and Letters:

Anthropology (2 courses elected)	6	
Deduct for repetition	1	5
Education (2 courses elected)	6	
Deduct for repetition	1	5
English (6 courses elected)	38	
Deduct for repetition	8	30
Germanic Languages and Literatures (8 courses elected)	12	
Deduct for repetition	2	10
Greek Language and Literature (6 courses elected)	11	
Deduct for repetition	3	8
Latin (5 courses elected)	12	
Deduct for repetition	1	11
Literature (3 courses elected)	17	
Deduct for repetition	3	14
Philosophy (6 courses elected)	20	
Deduct for repetition	7	13
Psychology (4 courses elected)	8	
Deduct for repetition	2	6
Rhetoric (English Composition) (5 courses elected)	13	
Deduct for repetition	3	10
Romance Languages:		
French (6 courses elected)		7
Italian (2 courses elected)		2
Romance Philology (1 course elected)		2
Semitic (4 courses elected)	5	
Deduct for repetition	3	2

In Pure Science:

Astronomy (1 course elected)		3
Botany (2 courses elected)		2
Chemistry (4 courses elected)	9	
Deduct for repetition	1	8
Geology (2 courses elected		4
Mathematics (3 courses elected)	5	
Deduct for repetition	1	4
Mechanics (1 course elected)		1
Physics (2 courses elected)		2
Zoölogy (2 courses elected)		4

In History and Political Science:

History (5 courses elected)	52	
Deduct for repetition	22	30
Political Economy (3 courses elected)	32	
Deduct for repetition	9	23

In the Schools of Applied Science:

Mechanical Engineering (2 courses elected)	4	
Deduct for repetition	2	2

In the School of Medicine:

The full first-year course equivalent to fifteen hours a week	3

In the School of Law:

The full first-year course equivalent to thirteen hours a week	9

There are two prizes for bestowal upon members of the graduating class: The Prize of the Alumni Association and the Chanler Historical Prize.

The three students nominated by the Faculty and submitted to the Senior class as candidates for the Alumni Prize of $50, given annually by the Association of the Alumni to "the most faithful and deserving student of the graduating class," were Frederick Paul Keppel, John Fulton Berrien Mitchell, Jr., and Franklin Zeiger; and Franklin Zeiger was chosen by the class to receive the prize.

The Chanler Historical Prize, consisting of the income of a fund of $1000, bequeathed by J. Winthrop Chanler, of the

Class of 1847, and given annually to that member of the graduating class who shall be the author of the best original manuscript essay in English prose on the history of civil government in America, or some other historical subject assigned by the Faculty, was awarded at Commencement to Lewis David Einstein for an essay upon "The Career of Thomas Hutchinson as Governor of the Province of Massachusetts."

Under the regulations, free tuition was granted during the past year to students:

In the Senior class	5
In the Junior class	5
In the Sophomore class	7

and reduced tuition to three Sophomores and three Juniors.

Remission or reduction of fees cannot be granted to any student during the first year of his connection with the College.

The whole number of applicants for admission, who were examined in the week ending June 13, 1898, was 214, distributed as follows:

Preliminary: those who take part of their examination and are candidates for the class entering in October, 1899	72
Final: those who took the preliminary examination a year ago and are candidates for the class entering in October, 1898	89
Full: those who take the entire examination at once and are candidates for the class entering in October, 1898	52
Special students	1
Total	214

Four scholarships, of the annual value of one hundred and fifty dollars each during the College course, are open for competition to candidates for admission to the Freshman class who are examined at the College in June and pass complete entrance examinations in all subjects:

The Alumni competitive scholarship, open to all candidates. The papers of the candidates who pass a satisfactory examination are considered by the Committee on Admissions, and the one whose papers as a whole are entitled to the highest rank is awarded the scholarship. At the recent examinations, this scholarship was awarded to Walter Lester Glenney, from the school of Mr. John Leal, Plainfield, N. J.; general average, 87 per cent. of a possible maximum.

Three Brooklyn scholarships, open for competition to candidates who are residents of Brooklyn, N. Y., and have received their training in either the public or the private schools of that borough. The papers of the qualified competitors who pass a satisfactory examination are considered by the Committee on Admissions, and the three candidates whose papers as a whole are entitled to the highest rank are awarded the scholarships. At the recent examinations, these scholarships were awarded to:—Edmond Jordan Harrison, from the Brooklyn Latin School; general average, 85.6 per cent.: George Beckwith Keeler, from the Boys' High School of Brooklyn; general average, 84.4 per cent.: Joseph Gardner Hopkins, from the Adelphi Academy, Brooklyn; general average, 83.8 per cent.

The completion of the fine Gymnasium in the University Building for use in October next necessitated a consideration of the best means of utilizing it for the benefit of the students. It was concluded that, unless a certain amount of athletic practice under the Director of the Gymnasium was insisted upon, the ample and expensive provision made by the Trustees would largely fail of its purpose. Our own experience in former years has shown that, when left entirely to their own volition, comparatively few students will persist in systematic and well directed physical exercise. Such exercise is of great benefit to both mind and body, and is especially desirable for city men and for students in a city college. The Faculty, therefore, very wisely made obligatory upon the members of the Freshman and Sophomore classes gymnasium practice, under the supervision and control of the physical director, for one hour on each of two days in the week—and this obligation must be discharged with as much regularity and particularity as any other obligation of the course.

In this connection, it may not be amiss to remark that a committee of the University Council, appointed for the purpose, has carefully considered the question of the representation of Columbia in intercollegiate athletic contests of various kinds. Such representations have been regularly had for at least a quarter of a century. Up to the present time they have been managed practically by the students themselves—and have, upon the whole and with few exceptions, been well managed. The general reputation gained by the students in these matters, for fairness, good conduct, and manliness, is high and well deserved. These contests have, however, now assumed such importance in relation to the life of the College and to the welfare of so considerable a body of its students, that it has been thought wise to supplement the supervision of the alumni and students with the authority of the College. The University Committee referred to, with a committee of alumni interested in and familiar with the subject, drew up a series of rules which, after having been printed and submitted for general criticism on the part of persons interested, officers and students, were adopted and will go into effect at the beginning of the next academic year. They meet the general approval, and will doubtless have the general and willing support, of the student body, as well as of the officers. In substance, they provide that no athletic association of the College (or any interest represented by it) can engage in a public contest unless its financial record is clear; that no contest can be entered into without the express sanction—as to character, time, and place—had in advance, of the University Committee; that no student can compete unless he be a *bona fide* student of the College or one of the Schools of the University; that a student may derive no pecuniary benefit from his connection with athletics; and that he must have a satisfactory record for attendance and scholarship, which he must constantly maintain or be excluded from the competition. Membership of a representative athletic team is highly esteemed by many students: to obtain and retain it they cheerfully submit to deprivations of many kinds and to all necessary discipline, however severe it may be. This is a fact of student life and not a speculation about it: it cannot be wisely ignored; it must be recognized, and should be so dealt with as to secure the greatest possible advantage to the students immediately involved, as well as to their fellows whom they largely influence. A student who is permitted to become a member of such a team has been granted what is, in his opinion and that of many others, a great privilege, for which he should be obliged to pay, and for which, in the great majority of cases, he would be glad to pay, the price demanded—which is, so far as the College is concerned, simply that he shall, in common with other students, and even more particularly than they, be a clean liver and faithful in the discharge of every academic duty.

Under the carefully drawn rules referred to, administered by the efficient and sympathetic committee in charge, it is fair to presume that intercollegiate athletic contests may be reasonably participated in, not only without harm to the scholarship and scholastic discipline of college students, but to their general benefit.

It is too early, perhaps, to speak with full authority as to the effect of removal to the present site and of the enlarged and diversified curriculum that became operative at the beginning of the present year. The apparent effect of both departures has been highly favorable.

The particular benefit of a collegiate education is, of course, in training. To be effective, the training must be constant and severe, and to secure its highest benefit should be undergone by the student in as consenting and eager a state of mind as possible. The favorable mental condition desired is fostered by the present curriculum, which, while insisting upon what are, by common consent, the essentials of a liberal education, yet grants to the students a rational freedom of election. The drudgery incident to college, as to any other thorough and painstaking work, is none the less obligatory, but it is robbed of its dreary character by losing its excessive irksomeness.

In making use of the freedom given them, I have found, speaking generally, that the students are solicitous of advice from their instructors and the Dean as to their choice of studies upon a consistent plan ; that they are not unduly affected by the desire to select easy subjects or to provide for the least possible amount of labor, but that, on the contrary, there is more occasion to restrict the number of hours and of subjects taken than to urge the selection of a fuller or more difficult course.

The number of students during the present year has been greater than ever before in the history of the College, and there is every prospect that the number for the coming year will be larger still. I think, therefore, it may be reasonably assumed that the great advantages of the new site (notwithstanding the lack of college dormitories that are sadly needed) and of the new curriculum appeal effectively to young men who desire a liberal education.

Respectfully,
J. H. VAN AMRINGE,
Dean.

OFFICERS OF INSTRUCTION

Professors	28
Adjunct Professors	3
Instructors	6
Tutors	14
Lecturer	1
Assistants	11

SCHOOL OF LAW

REPORT OF THE DEAN

FOR THE ACADEMIC YEAR ENDING JUNE 30, 1898.

To the President of Columbia University
in the City of New York :

SIR :

I have the honor to submit the following report of the work of the Law School for the academic year ending June 30, 1898.

The event of the year of far-reaching importance to the School was its removal from Forty-ninth Street to the present site of the University. It is significant of the complete separation of the work of the School from that of the law office, that at no time during the years of preparation for removal to Morningside Heights was the suggestion ever made by any officer or student of the University that it might be inexpedient to remove the Law School so far from the business centre of the city. Equally significant is the fact that an unprecedentedly large number of the second-year class of last year returned to the School this year as members of the third-year class.

In the occupation of the North Wing of the Library Building the School has found a home adequately meeting all its needs. It thereby enjoys not only all the advantages that could be derived from the occupation of a separate building, but also the advantages to be obtained from occupying in part the building which is the centre of the life of the University, and in which is housed the Library of the University. The Law Library and reading-room, under the charge for the first time of a trained and efficient law librarian and assistants, afford the student every opportunity for study and investigation. A room adjoining the reading-room not only serves as a place where consultations and conferences can be had between students, but provision is also made therein whereby the students can have at hand the books most needed by them in the library and lecture rooms. The assignment of two rooms for the use of the law clubs has given an impetus to the organization of clubs for the discussion and decision of moot cases. The value of the work done by the members of these clubs cannot be overestimated, consisting as it does in the drawing of pleadings, and the preparation of briefs for the argument of doubtful questions of law. The original investigation involved in the preparation of these cases, and the quickness of thought, and clearness of expression fostered by the arguments, make this work a fitting supplement to the work of the lecture room.

The following table gives the subjects in which candidates for the degree of Bachelor of Laws were examined at the close of the year, the names of the instructors, the number of lectures given per week in each subject, and the number of students examined therein:

Instructors.	Courses.	Hours per Week.	Number of Students.
	First Year.		
Prof. Hardon	Common Law Pleading and Procedure	2*	123
Mr. Terry	Contracts	4	125
Prof. Moore	Criminal Law and Procedure	2	124
Prof. Keener	Elements of Jurisprudence	2	123
	Equity	2	125
Prof. Kirchwey	Real and Personal Property	2	124
Prof. Burdick	Torts	2	125
Mr. Noble	Domestic Relations and Law of Persons	2*	125

* For half the year.

Instructors.	Courses.	Hours per Week.	Number of Students.
	Second Year.		
Prof. Canfield	Agency	2	116
Mr. Noble	Bailments	2	105
Prof. Hardon	Code Practice	2*	9
Prof. Burgess	Comparative Constitutional Law	3	7†
Prof. Kirchwey	Quasi-Contracts	2	112
Prof. Keener	Equity	2	117
Prof. Hardon	Equity Pleading and Procedure	2*	8
Prof. Burdick	Negotiable Paper	2	115
Prof. Kirchwey	Real and Personal Property	2	119
Prof. Burdick	Sales of Personal Property	2	114
Prof. Goodnow	Administrative Law	2	11†
Prof. Smith	Institutes of Roman Law	2	1†
	Third Year.		
Prof. Hardon	Code Pleading and Practice	2	25
Mr. Canfield	Doctrines Peculiar to New York Law	1	8
Prof. Keener	Equity	2	88
Prof. Canfield	Evidence	2	91
Mr. Noble	Insurance	2*	9
Prof. Moore	International Law	2	5†
Prof. Burdick	Partnership	2	91
Prof. Keener	Corporations	2	90
Prof. Kirchwey	Real and Personal Property	2	81
Profs. Burdick and Kirchwey	Suretyship and Mortgage	2	89
Prof. Hardon	Wills and Administration	2	62
Prof. Smith	Conflict of Private Law	1	2†

* For half the year.

† The records of the School of Political Science will show the number of law students taking this course as an optional or for degrees other than the degree of LL.B.

During the current academic year three hundred and sixty-seven students were registered in the School of Law, exclusive of students registered primarily under other faculties, divided into classes or groups as follows:

Third Year	94
Second Year	134
First Year	137
Specials	2
Students registered in the Law School	367
Seniors of the College	9
Total	376

The following is the result of the examination of candidates for a degree held at the close of the year:

Of the ninety-one members of the third-year class who presented themselves for examination, ten failed in one or more subjects, and therefore failed to receive the degree. Of the nine Seniors of the College who presented themselves for examination, two failed in one or more subjects.

Annexed hereto will be found tables showing the percentage of college graduates in each class and in the School as a whole, and the parentage of college degrees.

Respectfully,

WILLIAM A. KEENER,

Dean.

THIRD-YEAR CLASS.			SECOND-YEAR CLASS.			FIRST-YEAR CLASS.			SPECIAL STUDENTS.		TOTAL NUMBER IN SCHOOL.			TOTAL NUMBER OF COLLEGE GRADUATES IN SCHOOL.				
Number of Students.	College Graduates.	Percentage of College Graduates.	Number of Students.	College Graduates.	Percentage of College Graduates.	Number of Students.	College Graduates.	Percentage of College Graduates.	Number of Students.	College Graduates.	Total Number of Students in School.	Total Number of College Graduates.	Percentage of College Graduates.	Total Number of College Graduates in School.	Number of Columbia College Graduates.	Percentage of Columbia College Graduates.	Number of Graduates of Other Colleges.	Percentage of Graduates of Other Colleges.
94	59	62.76	134	87	64.93	137	83	60.58	2	1	367	230	62.67	230	27	11.74	203	88.26

PARENTAGE OF COLLEGE DEGREES

Adelbert College	1
Allegheny College	1
Amherst College	11
Bates College	1
Blackburn University	1
Bowdoin College	2
Brown University	2
Bucknell College	1
Christian Brothers College, St. Louis, Mo	1
Columbia University	27
Cornell College, Ia	2
Curry University	1
Drake University	1
Edinburgh University	1
Emory College	2
Eureka College	1
Franklin and Marshall College	1
Gymnasium, Frankfurt a/M	1
Hamilton College	1
Hanover College, Ind	2
Harvard University	22
Haverford College	1
Highland University, Kan	1
Hobart College	3
Johns Hopkins University	3
Kenyon College	1
Knox College	1
Lafayette College	1
Leland Stanford Jr. University	6
Lincoln University	1
McGill University, Canada	2
McMinnville College, Ore	1
Manhattan College	4
Mount St. Mary's College, Md	1
New York City College	27
New York University	6
Oberlin College	1
Oxford University, England	1
Parsons College, Ia	1
Pennsylvania Military College	1
Polytechnic Institute, Brooklyn	4
Princeton University	8
Ripon College	1
Roanoke College	2
Rutgers College	1
St. Francis Xavier's College	6

St. John's College, Md.	1
St. John's College, N. Y.	1
Seton Hall College	1
Swarthmore College	1
Syracuse University	1
University of California	1
University of Chicago	1
University of Cincinnati	1
University of Georgia	1
University of Havana	1
University of Kansas	2
University of Louisville	1
University of Michigan	3
University of Minnesota	1
University of Missouri	1
University of North Dakota	1
University of Rochester	2
University of the South	1
University of Wisconsin	1
U. S. Naval Academy	1
Washington University, St. Louis, Mo.	1
Williams College	11
Yale University	26
69 Colleges and Universities. Total Graduates	230

SCHOOL OF MEDICINE

REPORT OF THE DEAN

FOR THE ACADEMIC YEAR ENDING JUNE 30, 1898.

To the President of Columbia University
in the City of New York:

SIR:

I have the honor to submit the following report on the work of the College of Physicians and Surgeons for the year 1897–98:

There have been in attendance during the year 763 students, distributed as follows:

Fourth Year	143
Third Year	151
Second Year	189
First Year	220
Special Students	59
Old-Curriculum Student	1
	763

Of this number 237 held degrees as follows:

A.B.	128
B.S.	46
Ph.B.	16
LL.B.	1
Ph.G.	12
A.M.	15
Ph.M.	1
B.P.	1
M.S.	1
B.Sc.	1
V. S.	1
B.L.	1
M.D.	13
	237

DEPARTMENT OF ANATOMY

1. *Educational Staff of Department*

Dr. Geo. W. Crary was appointed Assistant Demonstrator of Anatomy at the beginning of the session to fill the vacancy caused by the death of Dr. Douglas Ewell.

There have been no other changes in the departmental staff during the year.

2. *Courses of Instruction*

A. Collegiate Courses.

Courses I to X have been given in the regular curriculum of the medical course. These courses were attended by 436 students, divided as follows:

212 students of the first year in Medicine.
189 students of the second year in Medicine.
24 special students in Anatomy.
3 Seniors of Columbia College taking the first year in Medicine.
8 special students of the third and fourth year.

The practical laboratory courses in dissection have been most successfully conducted by Dr. Gallaudet and the staff of assistant demonstrators. The total number of parts issued for dissection during the academic year was 1372. Of these 726 were supplied to the first-year class and 646 to the second-year class. The average number of parts dissected by students of the first year was 3.6, by the students of the second year 3.2. The advantages of the additional dissecting-room space provided by the new building, and its value to the thorough and complete laboratory course in practical anatomy now offered by the Department, cannot be overestimated.

B. University Courses.

The attendance upon the University courses, offered under the Faculty of Pure Science and open as majors and minors to candidates for the higher University degrees and as optionals to qualified candidates for the medical degree, has been more than double that of any previous year. The Department regrets that owing to the unavoidable limitations a number of applications for these courses had to be denied.

The attendance is shown in the following table :

1. *Candidates for the Degree of A.M. or Ph.D.*

Subject of Course.	Number of Students.
Comparative neurology	5
Comparative morphology of the uro-genital system	9
Cranio-cerebral topography	4
Comparative morphology of the respiratory apparatus	1
Comparative morphology of heart and vascular system	1

2. *Optional Courses taken by Candidates for the Degree of M.D. and by Post-Graduates.*

Comparative neurology	4
Total	24

Four members of the graduating class in Medicine fulfilled the University requirements and were recommended for the degree of A.M.

3. *Work of Fellow*

Dr. J. A. Blake, Alumni Association Fellow in Anatomy, has brought to a successful termination a most important research on the embryology and adult structure of the Fourth Ventricle, with especial reference to the metapore and the morphology of the Lateral Recess. Dr. Blake has been engaged in this work during the past two years, and his results will form one of the most valuable contributions of recent years to the anatomy of the central nervous system. Dr. Blake has also continued his researches on the topography of the thorax. His results were contained in a communication presented to the tenth annual meeting of the Association of American Anatomists, held at Ithaca,

N. Y., entitled: "The Relation of the Bronchi to the Thoracic Wall."

It is gratifying that Dr. Blake has been reappointed for another term by the Executive Committee of the Alumni Association.

4. *Museum Work, Research, and Publications*

The work of continuing the development of the Museum of Human and Comparative Anatomy has been carried on very successfully during the year. Nearly one thousand new preparations have been added to the collection. The Museum has been utilized this year more extensively than in the past in the practical work of instruction, because several important new series have recently been sufficiently advanced to warrant their employment for demonstration purposes. The value of the equipment continues to demonstrate itself, not only for the illustration of advanced courses in morphology, but also in the regular collegiate instruction of the medical course. The series dealing with the development and comparative morphology of the pectoral girdle, genito-urinary and digestive tracts, nervous system, respiratory apparatus, heart and vascular system have been thus utilized. Three special lectures and lantern demonstrations on the human and comparative anatomy of the female urogenital system were given in conjunction with the Department of Obstetrics to the third-year students.

The following publications by officers of the Department appeared during the year:

G. S. Huntington: "The Eparterial Bronchial System of the Mammalia." *Annals N. Y. Acad. of Sciences*, xi, 1898. Abstract in *Science*, vol. vii, No. 172.

G. S. Huntington: "Comparative Anatomy and Embryology as Aids in Teaching Human Anatomy in the Medical Course." *Am. Journal of the Med. Sciences*, 1898.

G. S. Huntington: "The Teaching of Anatomy." *Columbia University Bulletin*, No. xx, June, 1898.

Geo. E. Brewer: "Removal of a Sub-Cortical Cerebellar Tumor," etc. *Medical Record*, May 15th.

Geo. E. Brewer: "A Fatal Case of Gonorrhœal Infection, with Autopsy Report." *Journal of Cutaneous and Genito-Urinary Diseases*, June.

Geo. E. Brewer: "Some Observations upon the Surgical Anatomy of the Kidney." *Medical News*, July 31st.

Geo. E. Brewer: "Operative Surgery at the City Hospital, with a Completed Report on the Study of Wound Infection." *Medical Record*, March 13th.

J. A. Blake: "A Contribution to the Topographical Anatomy of the Mediastinum and the Superior Aperture of the Thorax." *Proceedings of the Association of American Anatomists, Ninth Annual Session.*

Churchill Carmalt: "Fractures in the New-Born." *Medical Report, Society of the Lying-in Hospital of New York*, 1897. D. Appleton & Co., pp. 283–308.

The Department participated in the meeting of the British Medical Association held in Montreal, in September, 1897, exhibiting a series of human myological and neurological variations.

The Department also took charge of the section of Anatomy in the fifth annual exhibition of the New York Academy of Sciences held in April at the American Museum of Natural History. The following series were exhibited by the Department:

1. Race brains.
2. Topography of the primary bronchi.
3. Development and comparative anatomy of the fourth ventricle.
4. Visceral anatomy of American reptiles.

Professor Huntington and Dr. Blake attended the tenth annual meeting of the Association of American Anatomists, held at Cornell University during the Christmas recess, and presented papers.

One of the most important additions of the year to the equipment of the Department is the establishment of a departmental library in direct connection with the research laboratory. During the summer, the Superintendent of Buildings partitioned off the southeast corner of the main laboratory, transforming the same into a room of good size, which has been equipped with bookcases, library furniture, and reading lamps. The collection of anatomical books and periodicals presented to the Department by Dr. F. H. Markoe has been considerably enlarged by purchase, exchange, and books received for review by officers of the Department. The more important anatomical periodicals are now kept on file in this room. The necessity of securing a working departmental library directly connected with the research laboratory has been accentuated by the removal of the library of the zoölogical department from the medical school to the new site. It is hoped that the department will be able to continue developing this important portion of the equipment.

The Department records with pleasure the proposed additions, to be made during the summer, to the cold-storage plant. The improvements contemplated will result in affording the much-needed increase in storage space, and the new method of handling material will result in much more complete and satisfactory preservation.

5. *Recommendations*

The Department desires to recommend repeatedly that the museum floors of the Anatomical Building be furnished with proper and sufficient cases for the reception of the collections. At present the old cases, inherited from the Pathological Museum, are overcrowded and have to be used merely for storage. It is not possible to carry out the systematic serial exhibition which is the chief purpose of the collection as applied to the requirements of instruction. The museum loses one of its most important educational features in not being accessible for purposes of serious study in its present conditions. Even for mere purposes of storage the available shelf room has long been exhausted, and deterioration and breakage are unavoidable among the large number of valuable preparations which have to be left without case protection.

The same conditions obtain in the portions of the basement of the new building designed for the accommodation of the Reference Osteological Collection. This collection is unrivalled in the number of individual preparations, and the complete record kept of each bone makes it invaluable for purposes of statistical research. Important work of this kind was done during the winter by Dr. Hrdlicka, the anthropologist connected with the State Institute of Pathology, but the lack of proper cases makes the material very difficult of access for study and classification. It is earnestly hoped that these deficiencies in our equipment may be soon made good.

DEPARTMENT OF PHYSIOLOGY

In the Department of Physiology instruction has been given by Professors J. G. Curtis and F. S. Lee, and by Drs. R. H. Cunningham and R. Hunt.

The following is a summary of the courses given during the year:

Course.		No. of Students with Candidacy for Degree.	
I. General Physiology	6	Ph. D.	2
		A.M.	4
II. Physiology of Man and Higher Vertebrates		M.D	412
III. Laboratory work of Course I	6	Ph.D.	2
		A.M.	4
IV. Special Laboratory work (special student)			1
V. Research	6	M.D.	2
		Ph.D.	1
		A.M.	1
		Special	2
Total			431
Names repeated			13
Corrected total			418

The researches carried on in the Department in 1897–98 by the members of the staff and workers under their direction were upon the following subjects:

The general physiology of the secretion.
The form of the muscle-curve in the different muscles of the turtle.
The form of the muscle-curve in the different muscles of the frog.
The nature and causes of muscular fatigue.
The effect of inanition and fatigue upon the structure of muscle.
The physiology of the cardiac nerves.
The absorption of fat.
Absorption from the peritoneal cavity.
The influence of fasting upon the bactericidal action of the blood.
A method for the re-distension of the collapsed lung.
Ether-anæsthesia by the rectum.
The effects of intestinal irrigation upon the arterial pressure, the renal secretion, intestinal absorption, and the body-temperature.
The effects of different anæsthetics upon the circulation in the kidneys.
The effects of antitoxins upon the kidneys.
The influence of iodothyrine upon the cardio-inhibitory fibres of the vagus.
The physiological action of strychnine.

The following publications by workers in the Department appeared during 1897–98:

F. S. Lee, Ph.D.—Physiology at the British Association. *Science*, October 8, 1897. N. S. vi, 550.
The Functions of the Ear and of the Lateral Line in Fishes. *American Journal of Physiology*, i, January 3, 1898.

R. H. Cunningham, M.D.—A Case of Acromegaly in a Dog. *The Journal of Comparative Medicine and Veterinary Archives*, July, 1897.

Aseptic Formalin Catgut. *The Medical Register* (*Virginia*), January 15, 1898.

The Cortical Motor Centres of the Opossum (Didelphys virginiana). *The Journal of Physiology*, vol. xxii, No. 4, February 17, 1898.

The Restoration of Coördinated Volitional Movement after Nerve-"Crossing." *The American Journal of Physiology*, vol. i, March 1, 1898, No. 2.

Experimental Thyroidism. *The Journal of Experimental Medicine*, vol. iii, No. 2, 1898.

R. Hunt, M.D., Ph.D.—Review of Marcet's "A Contribution to the History of the Respiration of Man." *New York Medical Journal*, August, 1897, lxvi, 195.

R. Hunt, M.D., Ph.D., A Bookman, A.B., and M. J. Tierney, A.B.—Einige allgemeine Eigenschaften des Herzmuskels des amerikanischen Hummer (Homarus americanus). *Centralblatt für Physiologie*, July, 1897, xi.

R. Hunt, M.D., Ph.D., and D. W. Harrington, M.D.—Notes on the Cardiac Nerves of the Opossum (Didelphys virginiana). *The Journal of Experimental Medicine*, November, 1897, ii.

Notes on the Cardiac Nerves of the Calf. *Ibid.*, November, 1897, ii.

D. W. Harrington, A.M., M.D.—Contributions to the Physiology of the Cardiac Nerves in the Guinea-Pig. *The American Journal of Physiology*, vol. i, May 1, 1898, No. 3.

S. J. Meltzer, M.D.—Ueber Reizversuche mit Inductionsströmen am Tiermagen. *Archiv für Verdauungskrankheiten*, Band iii, Heft 2.

A further Experimental Contribution to the Knowledge of the Mechanism of Deglutition. *The Journal of Experimental Medicine*, vol. ii, No. 5.

The Bactericidal Action of Lymph Taken from the Thoracic Duct of the Dog. *The Journal of Experimental Medicine*, vol. ii, No. 6.

S. J. Meltzer, M. D., *continued.*—On the Paths of Absorption from the Peritoneal Cavity. *Journal of Physiology*, vol. xxii, p. 199. On the Nature of the Cardiopneumatic Movements. *American Journal of Physiology*, vol. i, p. 117.

Ether-Anæsthesia by the Rectum. *Proceedings of the American Physiological Society*, *American Journal of Physiology*, vol. i, No. 2.

A simple Method for the Redistention of the Collapsed Lung. *Ibidem.*

R. C. Kemp, M.D.—Physiological Experiments with Intestinal Irrigation on Pulse Tension, Temperature, Renal Secretion, and Intestinal Absorption. *The New York Medical Journal*, January 29, 1898.

The following papers are in press:

R. H. Cunningham, M.D.—A Contribution to the Physiology of Fat Absorption.

Thyro-Colloid in Myxœdema: A critical experimental study of the active principles of the thyroid gland (Provisional title).

S. J. Meltzer, M.D.—The Influence of Fasting upon the Bactericidal Action of the Blood.

DEPARTMENT OF PATHOLOGY

In the Department of Pathology a new practical course in Clinical Microscopy for fourth-year men has been organized and successfully maintained by Dr. Ewing, assisted by Drs. Norris and Wood.

One hundred and forty-three regulars and six special students have taken this course.

The routine class instruction in Pathology has been given in two sections to one hundred and fifty-two men; while thirteen men, aside from our regular working force, have been engaged in research in Pathology and Bacteriology.

One hundred and eighty-eight men have taken the course in Elementary Bacteriology. Six men, two of whom were candidates for a higher University degree, have taken the advanced course in Bacteriology under Dr. Cheesman.

In the Normal Histology courses, two hundred men of the first year and one hundred and eighty-eight men of the second year have received instruction.

In the section of Photography, two students have taken the advanced course in photo-micrography while one has been making special studies in skiagraphy. A new and powerful X-ray apparatus has been installed, which has been largely used for clinical purposes in connection with the Vanderbilt Clinic and the Out-Patient Department of the Roosevelt Hospital and for special scientific studies. Four hundred and thirty-one negatives of various subjects have been prepared for members of the University staff and others.

The whole number of men engaged in practical laboratory work in this Department during the year is eight hundred and ninety-six.

The Department has received as a bequest of the late E. C. Seguin, M.D., a valuable collection of books relating to the Anatomy and Physiology of the Nervous System and scientific apparatus and pathological material of importance.

A new card-catalogue system of recording the accessions of material and the results of examinations has been adopted this year by which the working capacity and permanent accomplishments of the Department are greatly increased.

Nearly fifteen hundred specimens have been received in the Department during the year from hospitals, dispensaries, and practitioners, which have been examined and, in a large part of the cases, reported upon in writing.

The following formal papers have been published by workers in this Department since the last report:

By John Slade Ely, M.D.

"Bacterial and Allied Tests as Applied to the Clinical Diagnosis of Typhoid Fever."

By Pearce Bailey, M.D.

"Report upon Two Cases of Tumor of the Spinal Cord."

By James Ewing, M.D.

"The Lymphatic Constitution and its Relation to Some Forms of Sudden Death."

By Smith Ely Jelliffe, A.B., M.D.

"Some Laboratory Moulds."

By Philip Hanson Hiss, Jr., M.D.

"On a Method of Isolating and Identifying Bacillus Typhosus Based on a Study of Bacillus Typhosus and Members of the Colon Group in Semi-Solid Culture Media."

By S. J. Meltzer, M.D., and Charles Norris, M.D.

"The Bacterial Action of Lymph Taken from the Thoracic Duct of the Dog."

By Eugene Hodenpyl, M.D.

"On the Occurrence of Typhoid Fever without Characteristic Lesions of the Small Intestine"; and

"A Modification of Cullen's Method of Preparing Fresh Sections for Microscopic Work."

By Henry Heiman, M.D.

"Further Studies (Third Series) on the Gonococcus (Neisser)."

By W. H. Thompson, M.D., LL.D., and James Ewing, M.D.

"A Case of Acute Leukæmia."

By W. H. Bates, M.D.

"Suture of the Cornea after Removal of the Lens."

By James Ewing, M.D.

"Studies of Ganglion Cells.—A Preliminary Communication."

By Isaac Levin, M.D.

"On the Therapeutic Value of Blood-Letting—An Experimental Study."

By J. H. Larkin, M.D.

"Hæmorrhagic Pancreatitis with Liver Abscess."

By T. M. Cheesman, M.D., and S. J. Meltzer, M.D.

"An Experimental Study of the Direct Inoculation of the Spleen with Micro-organisms; and a Contribution to our Knowledge of the Importance of the Lesion of a Body-Tissue for the Settlement and Development of Bacteria within it."

Volume V of the "Studies from the Department of Pathology" has been issued, in two parts, during the year.

The departmental library has been maintained as heretofore by private subscriptions of the workers in the Department, but this is a burden which it is hoped will ere long be at least lightened, from the resources of the University.

DEPARTMENT OF MEDICINE

The work of the Department of Medicine has been carried on as usual with one exception. This year, for the first time, instruction has been given to sections of the fourth-year class at Bellevue Hospital. Doctors James, Jackson, and Brannan have conducted this work with much zeal and intelligence, and it has proved a valuable addition to our clinical facilities.

DEPARTMENT OF NERVOUS DISEASES

In the Department of Nervous Diseases twenty didactic lectures, and thirty-five clinics have been given by Professor Starr; with five lantern lectures demonstrating the structure of the brain, and its diseases. The fourth-year class has received instruction in the diagnosis and treatment of nervous diseases in sections of twelve men each, from Drs. Peterson and Caswell. Dr. Peterson has held two series of clinics upon Insanity at Ward's Island Asylum—eight in all, and the class has attended these clinics regularly on Saturdays, for three hours at a time.

The clinical work of the Department at the Vanderbilt Clinic has been so large as to require the services of seven assistants every day. Many publications, based upon work at the clinic, have appeared during the year—a series of clinical reports, with photographic illustrations, being regularly published in the *Journal of Nervous and Mental Diseases.*

The most important publication from the Department is the work of Dr. Pearce Bailey, entitled *Accident and Injury —Their Relations to Diseases of the Nervous System*, a volume of 420 pages, published by D. Appleton & Co., and dedicated to Professor Starr. It is based very largely upon material obtained in the Vanderbilt Clinic, and has great medico-legal as well as clinical value.

DEPARTMENT OF OBSTETRICS

In the Department of Obstetrics the usual didactic lectures have been given by Professor McLane to students of the third year; and instruction given in the form of recitations and demonstrations to students of the second year by Dr. Tucker.

Systematic bedside instruction has been given daily to the fourth-year class in the Sloane Maternity Hospital by Dr. Voorhees. Each member of the graduating class had a two weeks' residence at the Hospital, and personally conducted one or more cases of labor.

Twelve physicians, graduates of the College, have each served three months as assistants to the house physician, during the year, and thus obtained a most valuable obstetrical experience.

DEPARTMENT OF GYNECOLOGY

The work in the Department of Gynecology has been continued on practically the same lines as heretofore. At the Roosevelt Hospital clinics have been given regularly throughout the year on Tuesdays, Thursdays, and Saturdays in the "McLane Operating Theatre." These clinics have been well attended by the students, who have there witnessed a large number of major and minor operations covering the entire domain of Gynecology. At the Vanderbilt Clinic regular instruction has been given to the class, in sections, by Drs. Jarman and Stone.

DEPARTMENT OF LARYNGOLOGY

During the past session, the Department of Laryngology has, for the first time, dealt with the fourth-year students.

In a class of 143 (six of whom are always in attendance at the "Sloane Hospital"), there were present, at the first lecture, 147, at the last, 134, demonstrating both interest and prompt attendance. The reports from the classes of "Practical Instruction" are equally satisfactory.

Certain *new lectures* have been delivered this session in the didactic course; others are in preparation that cover the intermediate ground, heretofore uncovered, between general Surgery and its special departments of Laryngology and Rhinology, with the operations, etc., pertaining to them.

In the department of "Practical Instruction" also, certain changes in the course have been made, and a new requirement added:

I. The personal demonstration, to each section of students under instruction, of a number of pathological cases, specially those that are illustrative of the diseases considered in the didactic course of lectures given by Professor Lefferts.

This has not heretofore been done, but will be made a special feature hereafter.

II. Illustration, to each student, of the method of obtaining material from affected throats, for bacteriological cultures and differential diagnostic purposes.

III. Special demonstration of cases illustrating the common questions of differential diagnosis in ordinary throat diseases.

IV. A rearrangement of method in handling the teaching material of the "Clinic," whereby each student may examine a larger number of both normal and abnormal cases during his course than heretofore.

V. The easier examinations (that require instrumental aid) being first presented for his acquirement, before he proceeds to the more difficult ones (laryngoscopy).

These latter changes in the course have rendered additional assistance necessary. Dr. Wm. K. Simpson, Class '80, has been appointed an Instructor in Laryngology.

DEPARTMENT OF DISEASES OF CHILDREN

The work done in the Department of Diseases of Children resembles that of former years. During the course of 1896–1897 there was no fourth-year class, but there was a fair attendance of students and graduates at the Wednesday clinics of Professor Jacobi, which were not interrupted. In 1897–1898 these clinics were well attended by the fourth-year class, and the practical courses of the chief of clinic, Dr. Francis Huber, were eagerly followed. From October to March, Professor Jacobi also taught alternating classes at the bedside. For this weekly instruction the wards of the St. John's Guild Hospital, 155-157 West 61st Street, were made accessible by the authorities of that institution.

DEPARTMENT OF GENITO-URINARY DISEASES

During the year, 10,649 visits have been made by patients to the Department of Genito-Urinary Diseases, in the Vanderbilt Clinic, 2714 of this number being new cases, thus furnishing abundant material for Professor Taylor's clinics on Thursday of each week, and for the 209 students who have been instructed in sections by Dr. Hayden. Each section has also been taken by him once a week to the City Hospital on Blackwell's Island, where they have received bedside instruction in the wards, and witnessed operations belonging to this department.

Professor Taylor's Tuesday clinics at Bellevue Hospital have been largely attended.

The large and perfectly equipped rooms in the Vanderbilt Clinic, assigned to this department, and the increasing number of patients applying for treatment, will enable us to offer elective courses, in the future, to students who desire to perfect themselves in this branch of work.

DEPARTMENT OF ORTHOPEDIC SURGERY

The lectures in the Orthopedic Department have been well attended, and the clinical material abundant. Professor Gibney reports that the examination papers this year were characterized by a high degree of excellence—giving evidence of the close attention paid to the teaching in his department.

DEPARTMENTS OF SURGERY AND MATERIA MEDICA

In the Departments of Surgery and Materia Medica the usual didactic lectures have been given by Professors Bull, Weir, and Peabody in the College Building, and clinical instruction in medicine and surgery in the wards of the New York and Roosevelt Hospitals.

The following persons connected with the College were called to military duty:

1st-year students.

Harry A. Bubb, military duty in Pennsylvania.

Carl Fulda, 2d Div., 2d Naval Battalion, N. Y.

Arthur J. Schneidenbach, private, U. S. S. *Nahant.*

S. M. Strong, Navy, New Rochelle, N. Y.

2d-year students.

Ralph A. Hayt, private in Hosp. Corps, U. S. A.

H. S. Satterlee, private, Squadron A, Troop 3, N. G., N. Y.

R. S. Bamberger, private, Hosp. Corps, 12th Reg. N. G., N. Y.

Lester L. Roos, private, Co. E, 9th Reg., N. G., N. Y.

Maurice H. Krebs, private, 71st Reg., Co. B, N. G., N. Y.

Wm. de F. Ireland, Hosp. Corps, 12th Reg., N. G., N. Y.

Geo. O. Pelgram.

3d-year students.

Oscar Watson

Jonathan M. Wainwright, Capt. 1st Reg., Conn. N. G.

Edward A. Aronson, private, 8th Reg. Infantry, N. G., N. Y.

Arthur M. Line, private, Troop A, N. Y. V. C.

C. W. Pollard,

4th-year students.

M. G. Burgess, received his diploma April 27, 1898, appointed Assistant Surgeon, U. S. A.

Samuel J. Kopetzky, received his diploma April 29, 1898, Hosp. Steward, 8th Reg. Infantry, N. G., N. Y.

George W. Lindheim, received his diploma April 29, 1898, Corporal in the 8th Reg. Infantry, N. G., N. Y.

Wm. P. Earl, received his diploma June 8, 1898, 31st Separate Company, N. G., N. Y.; had not received his commission of Assistant Surgeon at date of his letter.

A. H. Busby, received his diploma April 29, 1898, Hosp. Corps, 71st Reg., N. G., N. Y.

Emil A. Müller, received his diploma April 29, 1898, Acting Apothecary, 1st Nav. Bat. of N. Y., U. S. S. *New Hampshire.*

Letchworth Smith, military duty.

Old Curriculum.

Thomas A. Rothwell, Co. A, 22d Reg., N. G., N. Y.

Officer.

John H. Claiborne, Instructor in Ophthalmology, Adjutant in one of the Regiments from this State.

Dr. John Blair Gibbs, who was killed at Guantanamo, Cuba, graduated from this College in 1882.

Respectfully submitted,
James W. McLane, M.D.,
Dean.

SCHOOL OF MINES
SCHOOL OF CHEMISTRY
SCHOOL OF ENGINEERING
SCHOOL OF ARCHITECTURE

REPORT OF THE DEAN

FOR THE ACADEMIC YEAR ENDING JUNE 30, 1898.

To the President of Columbia University
in the City of New York:

SIR:

I have the honor to present the following report of the thirty-fourth annual session of the Schools under the Faculty of Applied Science, just closed.

During the year, four hundred and thirty students have been in attendance on the exercises of the Schools under this Faculty, distributed as follows:

Undergraduate Courses

Fourth Class	74	
Third "	62	
Second "	84	
First "	181	
		401

University Courses

For the Degree of Master of Arts	11*	
" " " " Doctor of Philosophy	2	
		13
Carried forward		414

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* Two of this number were also fourth-year students in regular undergraduate courses.

Brought forward	414
Elective Courses	
Specials	18
(13 of whom pursued Architectural Courses)	
Grand total	432
Deduct for students pursuing more than one course	2
Students primarily registered under this Faculty.	430

The regular undergraduate students have pursued the different courses in the Schools under the Faculty of Applied Science, as follows:

	First Class.	Second Class.	Third Class.	Fourth Class.	Total.
SCHOOL OF MINES:					
Mining Engineering	21	16	6	14	57
Metallurgy	0	0	1	2	3
SCHOOL OF CHEMISTRY	14	9	7	5	35
SCHOOL OF ENGINEERING:					
Civil Engineering	30	13	12	20	75
Electrical Engineering	60	33	25	23	141
Mechanical Engineering	14	0	0	0	14
SCHOOL OF ARCHITECTURE.	42	13	11	10	76
	181	84	62	74	401

Of the above-mentioned students the following number received free tuition:

First Class	3[*]
Second "	13[†] [‡]
Third "	4[‡]
Fourth "	15
Master of Arts	2
Doctor of Philosophy	0
	37

The following table shows the number of students who have attended the School of Mines and associated Schools since the foundation:

[*] Pulitzer Scholarships.

[†] One free for first half-year only.

[‡] One Pulitzer Scholarship in each class.

	M.E.	Met.	Geol.	Chem.	C.E.	S.E.	E.E.	Mech E.	Arch.	Special.	Not Stated.*	Graduate.	Total.	Studied in two Courses.	Actual No. of Students.
1864-5..	.....	...	...	....	....	...	....	...	...	...	...	...	47	....	47
1865-6..	30	...	...	....	....	...	....	...	...	45	23	...	98	....	98
1866-7..	41	...	1	1	....	...	....	...	...	53	27	...	123	....	123
1867-8..	39	...	1	2	....	...	....	...	...	43	23	...	108	....	108
1868-9..	26	...	1	3	....	...	....	...	...	25	33	...	88	1	87
1869-70.	22	...	...	5	1	...	....	...	...	25	24	...	77	2	75
1870-1..	17	...	...	8	1	...	....	...	...	44	31	...	101	4	97
1871-2..	22	...	1	5	2	...	....	...	...	62	29	...	121	3	118
1872-3..	33	1	1	7	10	...	....	...	...	38	47	...	137	4	133
1873-4..	69	6	1	12	34	...	....	...	...	25	46	...	193	28	165
1874-5..	81	2	1	16	60	...	....	...	...	22	62	...	244	44	200
1875-6..	91	...	1	25	69	...	....	...	...	28	61	...	275	49	226
1876-7..	94	...	2	24	51	...	....	...	...	20	69	...	260	30	230
1877-8..	92	1	5	42	55	...	....	...	...	18	71	7	291	45	246
1878-9..	79	...	1	53	58	...	....	...	...	26	75	16	308	44	264
1879-80.	67	...	...	66	26	...	....	...	...	40	78	11	288	....	288
1880-1..	84	...	...	51	24	...	....	...	...	...	87	16	262	....	262
1881-2..	111	...	...	35	28	...	....	...	2	...	95	3	274	....	274
1882-3..	114	...	1	34	27	...	....	...	11	1	80	8	276	....	276
1883-4..	155	...	3	52	52	...	....	...	27	...	...	1	290	....	290
1884-5..	115	3	2	50	61	...	....	...	35	...	...	3	269	....	269
1885-6..	84	4	...	50	71	...	....	...	29	...	...	2	240	....	240
1886-7..	67	6	3	56	89	2	....	...	45	...	...	19	287	....	287
1887-8..	42	8	2	37	91	2	....	...	53	...	...	8	243	....	243
1888-9..	41	8	2	35	82	...	....	...	63	5	...	7	243	....	243
1889-90.	38	7	2	34	78	1	19	...	76	...	...	5	260	....	260
1890-1..	40	7	3	35	86	1	14	...	70	12	...	9	277	....	277
1891-2..	53	5	3	26	102	1	9	...	72	33	...	21	325	....	325
1892-3..	49	4	2	22	82	1	64	...	82	24	...	7	337	....	337
1893-4..	52	4	1	27	80	...	96	...	75	38	...	7	380	....	380
1894-5..	60	5	...	22	84	...	116	...	74	27	...	11	399	....	399
1895-6..	49	5	...	22	67	...	121	...	77	29	...	5	375	1	374
1896-7..	48	4	...	28	72	...	137	...	82	22	...	6	399	2	397
1897-8..	57	3	...	35	75	...	141	14	76	18	...	13	432	2	430

The table exhibits a steady growth in the total number of students. The number this year is the largest since the foundation of the School of Mines. During the past ten years, the increase has been mainly due to the course in Electrical Engineering, which has grown rapidly since its establishment, and for the past five years has attracted more students than any other. The new course in Mechanical Engineering begins with a class of fourteen, and it is hoped that it will prove equally attractive. The other courses, for the most part, show steady gains for the past three years, but on the other hand for the past ten years they have maintained on an average about the same numbers of students. This seems to indicate that these courses have attained nearly or quite their full development as to the numbers of students to be drawn from the area tributary to this institution. It is probable, however, that these courses will show small gains in the future, sharing in the natural growth of the University as it extends its area of influence.

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* Formerly the first year was the same for all courses, and students were not required to elect their course of study till the following year.

The following is a complete list of the degrees awarded at Commencement in the several courses:

Undergraduate Courses			
School of Mines :			
Engineer of Mines	19		
Metallurgical Engineer	2		
School of Chemistry :			
Bachelor of Science	5		
School of Engineering :			
Civil Engineer	20		
Electrical Engineer	23		
School of Architecture :			
Bachelor of Science	15		
		84	
University Courses			
Master of Arts		6	
			90

The above includes the following degrees, which were granted during the year to candidates who failed to comply with all the requirements at last Commencement:

Engineer of Mines	3	
Civil Engineer	1	
Electrical Engineer	2	
Bachelor of Science (in Architecture)	1	
		7

Among the degrees granted at Commencement were the following to members of the graduating class who have been called away for military or naval duty, and to whom diplomas were given under the resolution of the University Council of April 19th:

William Tudor, Jr., Engineer of Mines.

Johnston Livingston, Jr., Electrical Engineer.
Bartow White Van Voorhis, 2d, Electrical Engineer.
Charles Sidney Haight, Bachelor of Science (Architecture).

The standing of certain other students who had to leave for the same reason was not such as to justify this action in their case, but they will be permitted to return and make good their deficiencies without prejudice by reason of absence, and will eventually receive their degrees.

The following table shows the number of graduates in the different courses of study since the foundation of the School of Mines:

	M.E.	Ph.B or Met. Eng.	Ph.B. (Geol.)	Ph.B. or B.S. (Chemistry.)	C.E.	S.E.	E.E.	Ph.B. or B.S. (Architecture.)	A.M.	Ph.D.	Degrees Taken.	Took more than one Degree.	Graduates.
1867	1	....	...	....	....	...	....	....	...	...	1	....	1
1868	14	....	...	....	....	...	....	....	...	...	14	....	14
1869	21	....	...	....	....	...	....	....	...	...	21	....	21
1870	9	....	...	....	....	...	....	....	...	1	10	....	10
1871	8	....	...	1	....	...	....	....	...	...	9	....	9
1872	8	....	...	....	....	...	....	....	...	...	8	....	8
1873	6	1	...	2	....	...	....	....	...	...	9	2	7
1874	7	....	...	....	1	...	....	....	...	...	8	....	8
1875	10	1	1	5	5	...	....	....	...	1	23	4	19
1876	15	...	...	3	16	...	....	....	...	3	37	13	24
1877	29	....	...	....	27	...	....	....	...	6	62	26	36
1878	26	....	2	10	6	...	....	....	...	2	46	7	39
1879	20	....	1	5	8	...	....	....	...	3	37	3	34
1880	15	....	...	11	9	...	....	....	...	9	44	10	34
1881	14	....	...	22	8	...	....	....	...	2	46	3	43
1882	23	....	...	12	5	...	....	....	...	4	44	7	37
1883	22	....	...	5	7	...	....	....	...	4	38	5	33
1884	37	....	...	9	15	...	....	5	...	5	71	10	61
1885	37	....	1	3	4	...	....	3	...	1	49	2	47
1886	16	....	...	4	9	...	....	5	...	2	36	3	33
1887	22	2	...	11	13	...	....	4	...	2	54	3	51
1888	5	2	...	15	14	...	....	8	...	1	45	3	42
1889	14	....	1	6	19	2	. ..	11	...	2	55	4	51
1890	6	6	...	6	17	...	....	17	...	6	58	4	54
1891	5	....	...	3	12	...	5	11	3	1	40	5	35
1892	9	....	1	6	18	...	7	5	9	...	55	10	45
1893	8	....	1	2	13	...	3	13	3	2	45	3	42
1894	6	....	1	5	17	...	12	15	1	6	63	6	57
1895	13	1	...	4	22	...	13	16	...	7	76	...	76
1896	12	1	...	4	9	...	15	17	2	...	60	2	58
1897	6	....	...	3	15	...	26	9	4	...	63	2	61
1898	19	2	...	5	20	...	23	15	6	...	90	....	90
	463	16	9	162	309	2	104	154	28	70	1317	137	1180

The number of students who have matriculated since 1864 is 3384. Deducting 326 still on the rolls, there remain 3058 students, of which number 1180 have been graduated, or 38.6 per cent. During the past three years the proportion graduated has been 44.6 per cent. As the requirements for graduation have not been changed, and as they are enforced as rigidly as heretofore, this, perhaps, indicates that we are now receiving a better class of students than formerly. If so, this is a gratifying result of the increased requirements for admission of late years.

Graduates of other institutions to the number of sixty-one have been in attendance at the Schools of Applied Science during the past year. The following is a list of the institutions from which they graduated and the degrees which they have received:

PARENTAGE OF DEGREES

College of the City of New York	9
Columbia University	14
Cornell University, Ithaca, N. Y	2
Harvard University, Cambridge, Mass	5
Johns Hopkins University, Baltimore, Md	1
Manhattan College, New York City	1
Massachusetts Institute of Technology, Boston, Mass.	1
Penn College, Oskaloosa, Ia	1
Pennsylvania Military College, Chester, Pa	1
Princeton University, Princeton, N. J	2
Rensselaer Polytechnic Institute, Troy, N. Y	1
Shurtleff College, Upper Alton, Ill	1
St. Francis Xavier College, New York City	3
Stevens Institute of Technology, Hoboken, N. J.	2
Trinity College, Hartford, Conn	1
University of Georgia, Athens, Ga	1
University of Minnesota, Minneapolis, Minn	1
University of Rochester, Rochester, N. Y	1
University of Wisconsin, Madison, Wis	2
Williams College, Williamstown, Mass	1
Yale University, New Haven, Conn	7

Foreign Countries:	
Munich Polytechnic High School, Germany	1
University of Havana, Cuba	1
University of Santiago de Cuba, Cuba	1
	61
Deduct for students holding more than one degree.	4
	57

Number holding degree of A.B	28
“ “ “ “ A.M	2
“ “ “ “ B.S	11
“ “ “ “ C.E	6
“ “ “ “ E.E	5
“ “ “ “ M.E	1
“ “ “ “ Mech.E	3
“ “ “ “ M.S	1
“ “ “ “ Ph.B	4
	61
Deduct for students holding more than one degree.	4
	57

Of the 61 degrees in the above table, 39 were granted for courses of study of a liberal character, and 22, representing 19 men, for a professional education. The former represent men who desire to supplement their liberal studies by a professional training, a most desirable class of students. Of this class, Columbia is represented by 8 students, the College of the City of New York by 9 of its graduates, Harvard University by 5, Yale by 3, St. Francis Xavier by 3, and eleven other institutions by one each.

Nineteen students, who have completed a technical course of study, here or elsewhere, have continued their professional work at Columbia this year. Among these students are six Columbia graduates, five of whom are candidates for higher degrees. The Sheffield Scientific School is represented this year by four graduates, Cornell University and the Stevens Institute by two each, the Massachusetts Institute of Technology, the Rensselaer Polytechnic, Princeton University, the University of Wisconsin, and Pennsylvania Military College by one each. These young men come to us to study mining (6), civil engineering (3), electrical engineering (6), and architecture (4).

During the year three hundred and one students applied for admission to the Schools under this Faculty, as follows:

Admitted, on full or final examination	119
Admitted by certificate or diploma*	50
Refused admittance	37
Took preliminary examination only	95
	301

Admitted to regular courses:

First Class	118	
Second "	6	
Third "	6	
Fourth "	5	
		135

Admitted as special students of

Mining Engineering	2	
Electrical Engineering	1	
Mechanical Engineering	1	
Architecture	11	
		15

Admitted as graduate students for

Master of Arts	2	
Doctor of Philosophy	1	3
Total new students		153
Admitted but did not enter †		16
Total admitted		169

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* Does not include the whole number so admitted, as the reports from the examining officers do not give this information in all cases. Candidates presenting regents' diplomas and certificates are included among those "admitted on examination."

† Three of these were granted leave of absence for a year in order to continue their studies in the preparatory schools.

The students entering the regular courses were admitted as follows:

Admitted without conditions	45
Conditioned in one or two subjects	58
“ “ more than two subjects	32
	135

As in previous years, the candidates for admission found considerable difficulty in meeting the entrance requirements in language, English, French, and German, and the greater part of the conditions are in one or more of these subjects. A committee of the Faculty was appointed to investigate the matter. As the result of their labors the following facts were established:

1. The difficulty is not confined to Columbia.

2. Students entering scientific schools here and elsewhere are not as well prepared in English and modern languages as the candidates for the classical courses at the same institution.

3. The candidates who are admitted with conditions in these languages prove to be largely students of less than average ability in other subjects as well, and more than half of them fail to maintain the required standard of scholarship and have to leave the school at the end of a year or two.

4. The remaining half, for the most part fairly good students, find little difficulty in making up their entrance conditions in English and modern languages.

5. Students found proficient in English and modern languages at entrance have proved to be men of more than average scholarship, and but few of them leave before graduation.

A circular letter was sent to a number of schoolmasters preparing students for Columbia, calling attention especially to the first and second of the facts above outlined. From the replies to this letter, it seems that the preparation of students for scientific schools is not yet provided for in a well organized or systematic manner. And not only is this the case, but, in addition, most students do not in fact decide to undertake a scientific course of study until late in their school career. In most cases their education up to this time has had quite a different object in view, and the entrance requirements of the Scientific School are too often met by a hurried cram in the subjects heretofore neglected. The best preparatory schools are organized to fit men for college, and, as a rule, the best students take the classical course.

The same condition of affairs exists in other countries, and the difficulty has been met on the part of the preparatory schools by reorganizing the system of secondary education, and on the part of the technical schools by a modification of the requirements for admission. In this country the newly organized public high schools have usually a scientific course, which meets fairly well the entrance requirements of the technical schools. The grammar schools, however, will be very slow in making the changes in curriculum necessary.

The technical schools in this country have met this state of affairs by adopting very low requirements for admission and adding to their curriculum subjects properly belonging to the preparatory schools. Columbia has always maintained a high standard of entrance requirements for its scientific schools, and is undoubtedly handicapped to some extent thereby. The recent action of the Board of Regents in requiring the equivalent of a high-school education for entrance to all degree-granting institutions within this State is therefore of especial interest to us.

It is important to recognize the fact that our doors may be opened to a large number of desirable students if credit can be given in some way for the time spent in the study of Latin and Greek. The entrance requirements should be sufficiently elastic to admit all desirable and well prepared candidates, even when their education has not been on the exact lines which we consider most desirable for a student of science.

Of the students admitted, twenty-three were less than eighteen years of age, of whom four were between sixteen and seventeen. It has been the custom of the committee to admit candidates under the required age only when they are well fitted physically as well as mentally to undertake the severe work required of our students.

Among important matters which have engaged the attention of the faculty this year may be enumerated the following:

1. The revision of the courses offered for the degrees of Master of Arts and Doctor of Philosophy. A list of 53 courses of study for these higher degrees has been prepared by a committee appointed for the purpose, and appears in the circular of general information. The number of courses offered by the different departments is as follows: Architecture 3, Civil Engineering 9, Electrical Engineering 4, Mechanical Engineering 10, Metallurgy 15, Mining 12.

2. The revision of the course for the degree of Metallurgical Engineer. Formerly this course differed but little from the regular course in mining. The revised course includes more instruction in chemistry and electrical engineering, and diminishes the time given to mining and mechanical engineering. With the addition of laboratory work in metallurgy, and the opportunities offered in the recently organized summer school of metallurgy, it is believed that the course is much improved and strengthened by these changes.

3. The introduction of laboratory work in general chemistry in the first year for all students except those in architecture.

4. The introduction of laboratory work in botany and in zoölogy for students taking those courses. These changes will materially add to the efficiency of the instruction in chemistry, botany, and zoölogy.

5. The establishment of summer schools in Industrial Chemistry and in Metallurgy, and a tentative step toward a summer school in Architecture.

6. The division of the class in Resistance of Materials into two sections under the charge of the departments of Civil Engineering and Mechanical Engineering respectively, permitting a certain degree of specialization in this subject. The laboratory work in each case will be under the direction

of the department giving the class-room instruction instead of under different departments as heretofore.

DEPARTMENT OF ASTRONOMY

The regular courses of instruction in geodesy were given to students of civil engineering as usual. The summer school in practical geodesy was in session from June 1st to July 12th at Osterville, Mass. The work was under the direction of the adjunct professor of astronomy, with the assistance of Dr. H. S. Davis, Charles Derleth, C.E., and W. C. Kretz, A.M. Twenty-four students were in attendance.

DEPARTMENT OF ARCHITECTURE

During the past year the number of teachers in this department has been increased by the addition of Mr. William T. Partridge, as a Lecturer in Architectural Design, and of Mr. Henry F. Hornbostel, Ph.B., of the class of 1891, as an Assistant in Architectural Design. The work in Design is still carried on under Professor Hamlin's direction, but part of the work in the draughting rooms is now done by Mr. Hornbostel for the Fourth-year men and by Mr. Partridge for the Second- and Third-year men. Both give an hour or two a week to work in the lecture room.

There have been no other changes from the arrangements of the previous year, except that the three hours of lectures and recitations have been made to run from half-past ten to half-past one, instead of from half-past nine to half-past twelve. This change was made to meet the needs of a considerable number of men living on Long Island and in New Jersey, who found it almost impossible to be on the ground promptly at half-past nine. The hour from half-past nine to half-past ten has been used to great advantage for exercises in Free-hand Drawing, in which a little tardiness is not a matter of great importance.

Two men in the Fourth year have taken the elective course in Architectural Engineering, pursuing their studies mainly in the department of Civil Engineering. Thirteen men, either professional draughtsmen or graduates of scientific schools, have been present as special students, for longer or shorter periods.

The greater comfort, convenience, quiet, and cleanliness of our new quarters, as well as their greater dimensions, have perceptibly improved the work of teachers and students alike. By lowering the ceilings of the smaller rooms, the space over them, immediately under the roof, has been made serviceable, and has been fitted with drawers and cases formerly used in the Engineering rooms in 49th Street. This makes an excellent Architectural Museum. The walls of the draughting rooms are covered with the plaster casts presented to the department by Mr. C. F. McKim in 1891, and with the thesis drawings of the last class, and upon the staircases are hung a unique collection of architectural details, copied from the staircase of Francis I. at Blois for Mr. Cornelius Vanderbilt, by him presented to the Metropolitan Museum, and given to us by the Trustees of the Museum, with his cordial consent.

DEPARTMENT OF BOTANY

During the first term the students of the First year to the number of thirty-seven, comprising those in the courses of Mining Engineering and Civil Engineering, attended lectures in Botany twice a week given by Professor Underwood. The establishment of botanical laboratories at the new site, with adequate floor space and facilities for laboratory instruction, will make possible a desirable change in the arrangement of the work of the class, so that each of the two sections will meet for an entire afternoon for lecture and laboratory work and will thus be able to obtain some practical insight into plant structure and plant life. The necessity of dividing the class into two sections for laboratory work also makes possible a more satisfactory adaptation of the work to the courses of Civil and Mining Engineering respectively.

DEPARTMENT OF CHEMISTRY

The Department of Chemistry suffered a very severe loss in the death of Adjunct Professor Charles Edwards Colby on October 18, 1897. Professor Colby had been in charge of the instruction in Organic Chemistry ever since a separate course in this branch of Chemistry was established, and he had made a great success of his instruction both in the lecture room and in the laboratory.

Marston Taylor Bogert, a graduate of Columbia College, and also of the School of Mines, who had since his graduation assisted Professor Colby in the work of instruction in Organic Chemistry, was appointed to take charge of this subject with the title of Instructor in Organic Chemistry, and Charles A. Harper, Ph.D., was appointed Assistant in Organic Chemistry.

The new laboratory of Industrial Chemistry was placed in charge of Charles Ernest Pellew, E.M., with the title of Adjunct Professor of Chemistry, assisted by Samuel A. Tucker, Ph.B., with the title of Tutor in Industrial Chemistry.

Edmund H. Miller, Ph.D., was appointed Instructor in Analytical Chemistry and Assaying, to succeed Henry C. Bowen, resigned.

J. Livingston Rutgers Morgan, B.Sc., Ph.D., was appointed Tutor in Chemical Philosophy and Chemical Physics, to succeed Ferdinand G. Wiechmann, resigned.

Herman T. Vulte, Ph.D., was appointed Instructor in Chemistry and placed in charge of the laboratory at the College of Physicians and Surgeons, where he was assisted by Francis Pitt Smith, Ph.B., Tutor in Chemistry, and Benjamin M. Jaquish, Ph.B., Assistant in Chemistry.

Arthur Pine Van Gelder, Ph.B., was appointed Tutor in Chemistry and placed in charge of the laboratory instruction in General Chemistry given to the students of Columbia College.

Charles H. Fulton, E.M., Henry C. Sherman, Ph.D., Cavalier Hargrave Jouet, Ph.D., and Edwin C. Holden, E.M., were appointed Assistants in Analytical Chemistry, to succeed Alexander R. Cushman, Ph.D.; John A. Mathews, M.S., A.M., and Hermann T. Vulté, Ph.D., resigned or promoted. At the end of the first term, Edwin C. Holden, E.M., resigned, and George Müller, Ph.B., was appointed to take his place.

Alexander A. Julien, Ph.D., resigned his position as Instructor in Microscopy and Micro-biology.

The Department took possession of its new and commodious laboratories in Havemeyer Hall about the first of October, although the mechanics had not fully completed the tables and other conveniences. Some weeks elapsed before it was possible to admit the students, but in a short time everything was in working order and the complete and admirable equipment of the different laboratories made it possible very materially to improve and increase the laboratory instruction.

The new building includes a large lecture room capable of seating 316 students, a medium lecture room capable of seating 126 students, and three small lecture rooms capable of seating each 35 students. There is a very large Museum on the main floor devoted to Chemistry in all its branches, Inorganic, Organic, and Industrial. There is a Qualitative Laboratory with tables for 96 students, which is for the present occupied in part by students in Qualitative Analysis, and in part by the Columbia College students in General Experimental Chemistry.

A Quantitative Laboratory accommodating 72 students; an Organic Laboratory accommodating 40 students; a Laboratory for Industrial Chemistry accommodating 40 students; a Laboratory for Chemical Philosophy and Chemical Physics accommodating 40 students; an Assay Laboratory accommodating 36 students.

In addition to these there are several smaller laboratories designed for special purposes:

A laboratory for water and gas analysis;

A laboratory for electro-chemical analysis;

A laboratory for photometric and spectroscopic investigation. There is also a special Chemical Library, and a study room and microscopic laboratory.

Besides these rooms there are many others employed as studies, offices, and private laboratories for the different chemical professors and instructors.

The number of students receiving instruction in the different laboratories was as follows:

General Chemistry from Columbia College	80	students
Qualitative Analysis	120	"
Quantitative Analysis	87	"
Organic Chemistry	30	"
Industrial Laboratory	26	"
Assay Laboratory	37	"
Laboratory for Physical Chemistry and Chemical Philosophy	18	"

Valuable additions have been made to the equipment of the different laboratories and museum. A friend of Samuel A. Tucker, Tutor in Industrial Chemistry, kindly offered to supply the more expensive forms of apparatus and instruments required for fitting up the Industrial Laboratory, to the amount of $2665.

There being no special appropriation for the extraordinary expense involved in equipping the several laboratories with new reagent bottles and the additional instruments and apparatus required at the new site, a friend of Professor Chandler offered to make good any deficiency that might arise. It was thus possible to equip the new laboratory of Physical Chemistry and Chemical Philosophy and to provide whatever was necessary throughout the building in the other laboratories. At the end of the year the amount necessary to make up the deficiency was $4520.

Messrs. Lewisohn Brothers contributed $200 for the purchase of books on Analytical Chemistry.

Some friends of Professor Ricketts contributed a five-horse-power motor for use in the Assay Laboratory, at a cost of $202.22. Other friends provided journals and special books and periodicals for the students' study room at a cost of $101.82.

Some friends of Professor Pellew and Mr. Tucker contributed $300 to pay the salary of the assistant librarian who took charge of the Chemical Library.

Very complete and valuable collections of dyestuffs for use in the Industrial Laboratory were contributed by W. J. Mathieson & Co., F. R. Bayer & Co., Pickhardt & Kuttroff, Victor Koechl & Company, and others.

In conclusion I wish to say that the work in the different laboratories has been extremely satisfactory, and our expectations with regard to the advantages to result from the occupation of Havemeyer Hall with all its conveniences have been fully realized. It will not, however, be improper for me to say that the Qualitative Laboratory has been overcrowded ; although the students were divided into two divisions coming on different days, so that each place was occupied by two different students, still its ninety-six places were found to be inadequate. These inconveniences, however, will disappear when the Chemical Department obtains possession of the fourth floor, which is now occupied by the Department of Architecture.

DEPARTMENT OF GEOLOGY

The personnel of the Department of Geology has been increased the past year by the addition of Dr. Alexis A. Julien, recently attached to the Department of Chemistry. Dr. Julien has the title of Instructor and Curator, and has assisted during the year in the instruction in General Geology and has had charge of the Museum of General and Economic Geology. In other respects the teaching staff has remained as before.

In the courses of instruction a change has been introduced with the purpose of putting the work in General Geology, as given to the students in the courses of Mining Engineering and of Metallurgy, in the Second instead of the Third year. The change has been carried out by combining the Second- and Third-year classes, and has occasioned no trouble. Instruction in Geology is no longer given to students in the courses in Chemistry. In other respects the lectures and conferences in Geology have been given as usual three times weekly to students in the courses of Mining Engineering, Metallurgy, and Civil Engineering.

The lectures in Economic Geology have been delivered three times weekly to students in the Fourth year of the courses in Mining Engineering and Metallurgy.

The work of the summer school in Geology was performed under the direction of Mr. Gilbert Van Ingen. The class stopped first at Little Falls, N. Y., and studied the contacts of the Paleozoic strata upon the ancient crystalline rocks. They went next to Rochester, and traversed the geological section exposed in the valley of the Genesee River, and subsequently they studied the Niagara gorge. Travelling thence to Marquette, Michigan, they passed a week in its vicinity, and at Ishpeming, upon the Huronian strata and the underlying crystalline rocks.

A short course in Petrography has been given to Second-year students in the courses of Mining Engineering and of Metallurgy as in previous years.

The year has been notable because the Department has become established in its new and commodious quarters. As a result, the work has been performed with much greater ease and efficiency than ever before.

DEPARTMENT OF CIVIL ENGINEERING

The removal of the University to the new site has afforded opportunity for the development of the Department of Civil Engineering in several directions. In the Second year, general work in Electrical Engineering, extending throughout the entire year, has been incorporated in the course. This addition, with the Electrical Engineering work of the Third year, gives the course a well balanced proportion in the electrical work which it has not hitherto enjoyed. In the Fourth year, an excellent course in the Metallurgy of Iron and Steel has been established, which gives the Department abundant strength in that direction, and affords educational training of a kind most essential to the civil engineer at the present time. The machine shops of the Teachers College have been opened to the students of the various engineering departments, and those in Civil Engineering are required to take a limited but sufficient amount of shop practice. This is intended for the attainment of, and is essential to, the highest efficiency in the work of structural and machine design done by the Civil-Engineering students.

Under the action of the Faculty the Department of Civil Engineering has been authorized hereafter to conduct all the testing laboratory work for the course in Resistance of Materials for the students in Civil Engineering, Mining, and Electrical Engineering, the testing laboratory of the Department of Mechanical Engineering being placed at the disposal of the Department of Civil Engineering at suitable times and for a sufficient period for the purpose.

The laboratory work of the hydraulic laboratory will hereafter be done in connection with the Worthington hydraulic laboratory of the Department of Mechanical Engineering. Neither of these laboratories has been available this year, but they will be in condition for more efficient work than ever before the beginning of the University work next October.

The Department has received a number of very useful gifts during the year, consisting of books, photographs of engineering works, numerous blue-print plans of structures and machines, as well as a large collection of full-sized specimens of the steel shapes rolled by the Carnegie Steel Company, Ltd.

Mr. A. E. Foyé, C.E., having resigned the instructorship in Civil Engineering, the adjunct professorship has been filled by the appointment of Mr. Earl Brink Lovell, C.E., who will begin his duties on July 1st. Mr. Lovell graduated from the College of Civil Engineering of Cornell University in 1891. After graduation he was engaged in railroad construction, operation, and maintenance, for two years, on the Michigan Central Railroad. He was instructor in civil engineering at Lafayette College for a short period, and since that time he has been instructor in civil engineering and assistant in the physical laboratory at Cornell University. It is the intention of the Department materially to extend and develop instruction in the field of railroad engineering.

DEPARTMENT OF ELECTRICAL ENGINEERING

The principal change in the curriculum of the Electrical Engineering course has been the introduction of mechanical shop-work into the First and Second years. The instruction in this subject includes working in wood and metal, and the very satisfactory experience during the past year indicates that it will greatly strengthen the course.

The teaching staff of the Department has also been reinforced by the appointment of S. G. F. Townsend, A.B., E.E., as Assistant in Electrical Engineering, who has rendered valuable services in many ways. The space and facilities both for lecture-room and laboratory instruction have been materially increased. Each of the four principal laboratories is exceedingly well adapted to its purpose. These include the Dynamo Room, Alternating-Current Room, Instrumental Laboratory, and Research Room. The first of these is large and admirably arranged, being entirely devoted to the Third-year work in handling and testing direct-current machinery. The second room is used solely by the Fourth-year class in order to separate the alternating-current work and minimize the danger which it involves. The fine electrical and magnetic measurements requiring the use of delicate instruments are performed in the Instrumental Laboratory, a large room with windows on three sides. Next to this is the Research Room in which special investigations and thesis work are carried on. These two laboratories being on the third floor are sufficiently removed from the noise and vibration of the machinery in the other two rooms, which are located in the basement, so that fine work may be performed free from disturbance. All of these rooms have been regularly used by the students during the greater part of the past academic year, in spite of the fact that the heavy machinery as well as instruments, furniture, etc., had to be brought to the new site and installed after the University opened last fall.

A most important facility is the large and reliable supply of electrical current which is afforded by the central power plant of the University. This consists of boilers having an aggregate capacity of 2000 H. P., two low-speed engines directly connected to two dynamos of 275 H. P. each, and two high-speed engines directly connected to two dynamos of 100 H. P. each. This electrical generating plant, having a total capacity of 750 H. P., and illustrating the latest and best practice in electrical engineering, furnishes current for electric lighting and for driving the motors and fans used in ventilating all of the buildings. Special conductors are also laid to convey to all the laboratories and lecture rooms of the Electrical Engineering Department an ample supply of current for experimental work. The power plant, on account of its magnitude and completeness, gives the students excellent opportunities to study the general economy of generating mechanical and electrical energy, as well as the individual operation of the various parts under practical conditions.

DEPARTMENT OF MECHANICAL ENGINEERING

The work of this Department belongs to two groups. There is first the fundamental relation which Mechanical Engineering bears to the development of all engineering courses, and which was recognized in 1877 at the first creation of an instructorship in Mechanical Engineering. The other division is the specific work for students pursuing the course for the degree of Mechanical Engineer, which has been inaugurated upon the removal of the University to its new site, at which the facilities for this course could be provided, which were impossible upon the contracted area in the old location. In certain departments the work is common, in others it is more extensive for the Mechanical Engineers than for students in other courses, and in a third group it is exclusively designed for Mechanical Engineers.

Within these divisions the work of the Department may be grouped into class-room assignments, practical work in the drawing-rooms, practical work in the Testing Laboratory and in the three other groups into which the Mechanical Laboratories may conveniently be divided.

Class-room exercises have included courses of lectures, by

Professor Hutton, on heat and heat engines, on water motors and such as use other media than steam, to the Fourth class, and upon properties of materials, to the Third class. The first two courses have been accompanied with manifold notes, which were used as a basis for recitation in connection with the lectures. In the exercises upon the Engineering of Power Plants, Steam Engines, and Steam Boilers, Professor Hutton's text-book, *Mechanical Engineering of Power Plants*, has been used with explanatory lecture material and abundant use of the projection lantern in the Second, Third, and Fourth years. Instructor Woolson has given courses in mechanism and transmissive machinery, and has extended the work in Properties of Materials for Electrical Engineers. Instructor Mayer has conducted the class-room work as well as the drawing-room exercises in descriptive geometry, graphics, shades, shadows, perspective, and other courses pertaining to successful draughtsmanship. A slight change has been made this year, whereby the instruction in the locomotive engine has been transferred to Professor Hutton for the Civil Engineers in the first term of their Fourth year.

The work in the drawing-rooms, under the splendid surroundings at the new site, has been most satisfactory and excellent. The drawing-rooms have a capacity for nearly one hundred and sixty persons at one time, and are splendidly lit with skylights, and electric light for dark days. The detail has been conducted by Instructor R. E. Mayer and Assistant Thos. H. Harrington. Work was begun immediately upon the removal when the Schools opened and a high standard has been attained among many of the draughtsmen.

The work in the Testing Laboratory and in the other features of the Mechanical Laboratories has been forced into abeyance for this year, by the delays which seemed unavoidable in connection with the installing, erection, and connection of the machinery and apparatus required. A great gain in efficiency will be the result of the assignment of the large room at the north end of the ground floor of the

Engineering Building, to Mechanical Engineering for its Testing Laboratory, whereby this work will be brought directly into connection with the class-room instruction and with the illustrative material accumulated in the museums. The assignment of this room to Mechanical Engineering was not perfected until after the first of January, and the necessity for installing electric power and for modifying the machinery employed at the old site brought the readiness of the laboratory so late in the year that no work in testing, such as is contemplated as a regular feature of the course, could be carried on. This work will be in the hands of Instructor Woolson and Assistant W. G. Hudson for the Mechanical and Metallurgical Engineers. It is intended to cover the testing of wood, iron, and steel, for compressive and tensile resistance, that they may become familiar both with the materials of construction and with the machines used for testing them and for observing and measuring the deformations under stress. It has been possible to make use of one of the machines for some limited experimental work on the transverse resistance of concrete beams, in connection with thesis work in the Civil Engineering course.

The same difficulties and limitations have been felt with respect to the other sections of the Mechanical Laboratories which are intended primarily for the students in the Mechanical Engineering Course, but which it is also intended shall be serviceable for thesis work and work of research in connection with the other courses, as well as for a considerable degree of routine practice.

The conditions of the University upon its financial side have precluded its bearing much of any share in the development of the new departments of its courses of instruction, but the generosity of friends of Mechanical Engineering and of the University have made this year a year of great interest and promise for the future. By direction of the President, and with the concurrence of the Trustees, the great Western Vault Annex between the Engineering and Chemistry Buildings, and lying underneath the esplanade, which separates them, was assigned last year to Mechanical Engineering, as the space into which the laboratory equipment should be allowed to grow, and the opportunity has been availed of in a most gratifying way. The annex is 210 ft. long, 21 ft. high, and has a width of 35 ft. at the broadest part. The eastern section, about 65 ft. in length, and 32 ft. in width, is to be known as the Henry R. Worthington Hydraulic Laboratory, the principal equipment for it in pumps, accumulators, and attached hydraulic machinery being the gift of Mr. Chas. C. Worthington, as a memorial to his father. It will offer facilities at present unparalleled, for the study of hydraulic formula, measurement of water, efficiency of water motors, and similar appliances. The steam pumps operated in connection with a surface condenser will also be made experimental engines of varied interest. The laboratory includes also hydraulic rams, impulse wheels, centrifugal pumps, meters, nozzles, weirs, gauges, etc. Its particular and unique character will be found in the facilities for investigations and tests with water under great pressures, running even as high as 5000 lbs. to the square inch. The students in Civil Engineering, by arrangement with that department, have the right to carry on their illustrative and experimental work in this laboratory, under their own instructors, during a designated part of the year.

The central section contains part of the equipment of the steam- and motive-power sections of the laboratories, and is made by the gift of Mr. William W. Allis of Milwaukee, a memorial to his father, and is to be known as the Edward P. Allis Laboratory. The central feature of the equipment of this laboratory will be a triple-expansion-Reynolds-Allis-Corliss steam-engine of 150 H. P., with all appliances for reheating between the cylinders and with its independent surface condensing apparatus so that all experimental work of a high-class large-power steam-engine can be satisfactorily and thoroughly conducted. But a unique feature of interest in connection with this engine is, that it is capable, by a very slight modification, of being transferred into a triple-stage air-compressor, with a capacity for pumping in three steps from atmospheric pressure to 250 lbs. The air series has inter-cooling cylinders, and furthermore, the inlet of the larger cylinder can be adjusted so as to take air from a receiver at pressures above the atmosphere and carry the compression to the higher ranges which are used in storage systems. This feature of an experimental steam-engine being made an air compressor, gives the mechanical laboratories a unique distinction in this field, and the flexibility of the design permits wide variations to be made in the conditions of experiment. This engine is to be installed during the winter of 1898–99, and to be ready for use when required for the Mechanical Engineers.

The transmission of power from this engine, when used as a steam-engine alone, to the other appliances for transmitting rotary motion has been made a memorial gift by Mr. Melville W. Mix, President of the Dodge Mfg. Company of Mishawaka, in memory of the late Wallace H. Dodge, founder of the Company. It will be a first-class typical American rope-drive, fitted with every appliance for tests of efficiency and for the conduct of investigations on the usual forms of apparatus used in mechanical transmission by rope, belt, friction clutches, etc.

Belonging to this same general section, but located for the present in the power house, is the section devoted to gas engines, hot-air engines, and similar motors. It has been found impossible to locate these in the laboratory annex without crowding to a point at which efficiency would be sacrificed. Certain small steam motors which are used in connection with tests of dynamometers, are also located in this same power-house section.

The generosity of friends has made it necessary to provide a section devoted to the Mechanical Engineering of Transportation. The central interest in this section attaches to the gift to the laboratories by the Baldwin Locomotive Works of Philadelphia, of a full-size express standard passenger locomotive of the Vauclain compound design, having a capacity, when running at full speed, driven from its own boiler, of 1600 H. P. This will be mounted upon friction wheels below the track surface, so that it can be run either under steam from its own boiler or by compressed air from the Allis engine, at various speeds, and it will be fitted with all necessary appliances for measuring consumption of water and fuel and the effects of varying the conditions of its operation within all ranges of speed. The supporting wheels are to be fitted with brake dynamometers, and it is expected that most interesting and valuable results can be secured. The fund necessary to install this gift has been secured by the munificence of interested friends, who have made donations in cash for this object.

Alongside of the locomotive will be a typical electrical car fitted with the General Electric Company's motors, upon axles, and with all other controlling devices. This car comes as a gift from the J. G. Brill Company of Philadelphia, and will be similarly mounted upon friction wheels with dynamometer brakes so that its efficiency and power at different speeds can be observed and measured. This car will be at the service of the Department of Electrical Engineering, for its students, but like the others has not been available for the year 1897–98.

The equipment of the Department in its various lines for calibration of apparatus used, is all to be made applicable to the conditions of these new laboratories.

The section of laboratory equipment devoted to study and practice in workshops has for this year, for the first time, been put into operation for the students of Engineering at the University. The shop devoted to wood-working and pattern-making has been under the charge of Instructor Edwin B. Finch of the Teachers College staff, and the work has been most effective and satisfactory. For the Mechanical Engineering students, two afternoons a week, of two and one-half hours each, have been devoted to work at the bench in joinery and framing, for the first term; in wood-turning and pattern-making, for the second term. The Summer School, devoting a period which is the equivalent of 100 hours, in the month of June, to pattern-making, moulding work, and foundry work, will bring the student to the objective point of the entire First-year course, which is the familiarizing of the young engineer with the conditions which must be met in the design of structures to be realized in cast iron. The students in Electrical and Civil Engineering have had one afternoon period of two and one-half hours per week and have pursued a selected course chosen from the more extended course of the Mechanical Engineers. It was not practicable this year to provide a summer class for the students of these courses as contemplated, by reason of the small number who desired to avail themselves of this privilege, which is optional. In the Second year, for the Electrical Engineers only, the course in the metal-working department has been conducted by Instructor Chas. P. Benns of the Teachers College staff. It has given one afternoon period of two and one-half hours per week in the first term to forging and bench or vise work, and the same period in the second term to work at the machine tools, with planer, lathe, milling machine, etc.

By the gift of Mrs. Margaret B. Edson, a Pratt and Whitney planer, a Brown and Sharpe Grinding Machine, and a Bradley Power Hammer have been added to the previous equipment of the Teachers College shop, and by the gift of the builders, an exceedingly fine Jones and Lamson flat turret lathe is regularly used as a feature of the instruction in economic production of machine parts. It is intended to make a decided feature of this department of the machine shop for the Mechanical Engineers, who will reach the course in the autumn of 1898, in their Second year. A gift from the Billings and Spencer Co. of Hartford, of a typical drop-press, which is on its way, will much increase the efficiency of the shops in the forging department. The Ingersoll-Sergeant Drill Company of New York City, through its President, W. R. Grace, and its Secretary, W. L. Saunders, have made a gift to the Steam Engineering Laboratory of a cross-compound steam, two-stage air-compressor, of their successful design, but its location is not fixed upon. Other and considerable gifts are in prospect, whose detail is not in a condition to announce.

The additions to the equipment and facilities of the Department this year, outside of those which are covered in the previous paragraph, have been :

By Gift :

From the Westinghouse Air Brake Company, certain details of the air-brake equipment ; from the Charcoal Iron Furnace Co. of Rednor, Canada, samples of charcoal iron and the raw materials ; from the Deane Steam Pump Company, sectional model of their type of direct-acting pump ; from the Sherwood Mfg. Co., of Buffalo, an example of their mechanical boiler-tube cleaner ; from the Pope Mfg. Co., an example of their chainless gear, both assembled and in detail ; from Morse, Williams & Co., a model of the Hindley worm gear ; from C. W. Hunt, a Henning extensometer ; from Payne Engineering Co., a model of the Rites Inertia Governor ; from the New York Safety Steam Power Co., a reconstruction of an upright vertical engine bought many years ago from them by the Department ; from the Yale and Towne Co., a triple-gear hoisting appliance of three tons capacity ; from the Brown Hoisting & Conveying Co., of Cleveland, the trolley apparatus for this hoisting appliance ; from Edward L. Coster, a very handsome model of the locomotive valve gear with every provision for adjustment and the variation of effect in varying adjustment, with appliances for making a record of the same ; from the Watson & Stillman Co., a three-ton hydraulic jack and a sectional model of same and a model of a hydraulic riveting machine ; from Manning, Maxwell & Moore, a working model illustrative of certain principles involved in the construction of the Shaw Electric Crane ; from the Carborundum Company, of Niagara Falls, samples of their raw material and product.

By Purchase :

A five-horse-power Crocker-Wheeler Electric Motor ; a ten-horse-power Edison Electric Motor, together with belts and transmissive machinery required to connect them with the testing machines in their new location ; a Bradley power hammer for the forge-shop; a considerable increase in the equipment of photographic lantern slides.

The vacation class in Mechanical Engineering has included this year a three days' trip to the works of the Bethlehem Iron and Steel Company, Bethlehem, Pa.

The advantage of more convenient arrangement of the Department, with respect to the convenient exhibition of its collections in museums and in the drawing-rooms, has made itself felt in an increased efficiency of instruction along all lines.

DEPARTMENT OF MATHEMATICS

The educational staff of the Department, the University courses of instruction given and the attendance at each, the work of the fellow or fellows, researches and publications of the Department, miscellaneous items of interest, and the number of collegiate and other courses, not herein referred to, given during the year, have all been stated in the report of the Department to the Dean of the Faculty of Pure Science.

The students of the First class in all the Schools except the School of Architecture have been taught by Mr. Maclay, Dr. Chittenden, and Mr. Keyser. The subjects taught were—trigonometry, analytical and spherical; mensuration of surfaces and volumes; so much of algebra as is not required for admission; and the whole of analytical geometry.

The accommodations at the new site made it practicable to subdivide this class into three sections, to the great benefit of the students. During the greater part of the year, the class attended four exercises a week; it was found, however, in the course of the second half-year, that it was practicable, by a slight rearrangement of subjects, to allow the class five exercises a week and thus enable them to complete the subject of analytical geometry—a distinct advantage.

Analytical geometry from loci of the second order, and the differential and integral calculus, were taught, four hours a week, by Professor Van Amringe, to the students of the

Second class in all the Schools except the School of Architecture. Hereafter the class will attend in two sections, each three hours a week, and be instructed in the differential and integral calculus only, the subject of analytical geometry being finished in the first term.

The several courses in Mathematics as set forth in the Announcement have been fully accomplished.

DEPARTMENT OF MECHANICS

The teaching staff of the Department of Mechanics remained the same during the academic year 1897–98 as during the two preceding years. Instruction under the Faculty of Applied Science was given by all members of the staff. The total number of undergraduate students receiving instruction was 115. The courses given, the instructors conducting them, and the number of students attending each course are stated below, the numbers assigned to the courses being those of the last annual catalogue.

Course I. Analytical Mechanics, three hours per week throughout the year, by Professor Woodward; 46 students.

Course IV. Thermodynamics, three hours per week, first half-year, by Professor Pupin; 64 students.

Course V. Elementary Thermodynamics and Hydromechanics, two hours per week throughout the year, by Mr. Pfister; 4 students.

Course VI. Theory of Dynamo and Motor, three hours per week, first half-year, by Professor Pupin and Mr. Freedman; 27 students.

Course VII. Theory of Direct-Current Dynamo and Motor, three hours per week, second half-year, by Professor Pupin and Mr. Freedman; 27 students.

Course VIII. Theory of Alternators and Transformers, three hours per week, first half-year, by Professor Pupin; 22 students.

Course IX. Theory of Variable Currents, three hours per week, second half-year, by Professor Pupin; 22 students.

Notwithstanding the important advantages afforded by the new buildings and plant of the University, the quantity and quality of the scholastic work during the past year fell somewhat short of the standard attained in the Department in previous years. The causes of this defect are chiefly three, namely: an unusually late beginning of the academic year, an unusual number of holidays during the year, and the shorter academic year. The novelties of the new site seem also to have been somewhat distracting to students.

Of the many increased facilities afforded by the new buildings, mention may be made here of the electro-mechanical laboratory of the Department. This, when fully equipped, will be of great service to students of electrical engineering. Amongst the apparatus added to this laboratory during the year the following are the most noteworthy: (1) An artificial electric cable 500 miles long. The accompanying condensers have stood a test of 3000 volts, and the coils are arranged in such a way that ground leakage (distributed along the line) and the self-induction may be conveniently changed within very wide limits. (2) Optical resonating telephone and double bridge for measuring amplitudes and phases of complex harmonic currents. (3) Hertzian oscillators and reflectors. Several students of the graduating class of the present year availed themselves of the opportunities for research in the laboratory.

The records of the past five years of work done by students of analytical mechanics, which is taken by all students of engineering and which is occasionally elected by students of chemistry and architecture, contain some statistics which seem worthy of mention. In the conduct of this subject it has been the uniform practice to require each student to solve, and to carefully write out the solutions of, thirty to fifty exercises during the year. These exercises are examined, criticised, and marked on a scale of ten; and the credits thus gained are given half weight with the results of the semi-annual examinations in deriving the final standing of any student.

Of the whole number of undergraduate students pursuing analytical mechanics during the years in question, 237 have met the requirements. The average of the marks assigned to these students is 7.60; the lowest mark assigned is 6.0, and the highest 9.6. With respect to the courses pursued the statistics are shown in the following table:

Course Pursued	No. Students	Average Mark	Lowest Mark	Highest Mark
Mining Engineering........	57	7.28	6.1	9.5
Civil Engineering..........	76	7.78	6.0	9.3
Electrical Engineering......	96	7.61	6.0	9.3
Metallurgy	..	...	..	..
Chemistry	8	7.88	6.9	9.6
Architecture	..	...	..	..

The figures in this table seem to show that no important differences as regards capacity for the pursuit of mechanics exist amongst the different classes of students.

Of the students included in the above enumeration, twenty held the degree of A.B., and twelve held the degree of B.S. It will be of interest to learn, therefore, whether the statistics with reference to these two groups indicate the superiority which might be expected in students who had previously obtained a baccalaureate degree. The average mark of those having the degree of A.B. is 7.56, the lowest mark being 6.3, and the highest 8.6. The average mark of those having the degree of B.S. is 8.4, the lowest being 6.6, and the highest 9.3. So far as one can judge from these figures, it would appear that a student holding the degree of A.B. is not better fitted, and that one holding the degree of B.S. is somewhat better fitted, than the average undergraduate for the pursuit of analytical mechanics. That previous collegiate, as distinguished from scientific, training is not specially advantageous as a preliminary to the study of mechanics is indicated further by the fact that of the twenty-six students who attained a mark of 8.5 or upwards (which is high on my scale), only one is among those who held the degree of A.B., while seven held the degree of B.S., and the remaining sixteen held no degree.

DEPARTMENT OF METALLURGY

Professor Howe has delivered the lectures on iron, steel, and copper, and Dr. Struthers those on general metallurgy, lead, and the precious and minor metals.

Laboratory instruction in metallurgy has been given during the entire year to the students in the course of metallurgy, and students in other departments have done considerable furnace work in the laboratories.

In July, 1897, the second year of the summer school in Practical Metallurgy was held at Chicago, Pittsburg, and environs, under the charge of Dr. Struthers. The manufacture of iron and steel was chosen for study, and the works of the Illinois Steel Co. and the Carnegie Steel Co., together with several others, were visited.

During the coming year, the course for the degree of Metallurgical Engineer will be changed so as to increase the difference between it and the course in mining engineering, by giving more instruction in chemistry and electrical engineering and less in mining and mechanical engineering than hitherto. The additions made are chiefly instruction in rapid methods of analysis, such as are in actual use in laboratories of metallurgical works, in gas analysis, in the calorimetry of fuels, in electro-chemistry, and electro-metallurgy.

Through the kindness of a friend, the metallurgical furnace room will be equipped with several furnaces to be used on an illustrative scale, and other much needed apparatus.

Dr. McIlhiney has resigned from the position of assistant in metallurgy, but will remain in the Department as an honorary assistant. Mr. R. S. McCaffrey, of the class of 1896, School of Mines, has been appointed to the assistantship.

The students of the School of Mines and Chemistry attending the lectures in metallurgy have visited during the year, and under direct charge of the Department, the works of the Nichols Chemical Co. at Laurel Hill, N. Y., of the Guggenheim Smelting and Refining Co. at Perth Amboy, N. J., and the foundry of the Worthington Pump Co. at

Elizabethport, N. J. The students of the School of Mines also visited the works of the Bethlehem Iron and Steel Co. at Bethlehem, Pa., with the class in mechanical engineering.

The Department has received many gifts of specimens of metals and metallurgical products for the collection and for use in the laboratories of the Department. Prof. Thomas Egleston has recently given the departmental library more than a hundred volumes of standard metallurgical works.

The departmental library, which was started this year, has been much used by students.

Nine new advanced courses in metallurgy have been offered, and a large number of new diagrams have been made.

Special Work and Publications by Professor H. M. Howe

"The Connections between the Hardening Power and the Retardations of Low-Carbon Steel." *Engineering and Mining Journal*, vol. lxiv., September 25, 1897, p. 367. *Engineering* (London), vol. lxiv., October 20, 1897, p. 514.

"Note on the Use of the Tri-Axial Diagram and Isometric Tetrahedron for Graphical Illustration." *Transactions of the American Institute of Mining Engineers*, vol. xxvii., to appear.

Also the following investigations, the results of which are not yet published:

(1) On the Melting-Point of Extra-Fusible Cast Irons.

(2) On the Hardening of Nickel Steel.

(3) On the Distribution of the Effects of Hardening in the Different Layers of a Bar.

(4) On the Hardening of Nearly or Quite Carbonless Iron, Copper, and Platinum in Melting Mercury and Melting Alcohol.

Special Work and Publications of Joseph Struthers, Ph.D.

Publications

Abstracts and Note References in Metallurgy for the year 1897. *School of Mines Quarterly*, April, 1898, vol. xix., No. 3.

Fuel and Refractory Materials, A. Humboldt Sexton. (Review.) *School of Mines Quarterly*, November, 1897, vol. xix., No. 1.

The Stamp Milling of Gold Ores, T. A. Ricard. (Review.) *School of Mines Quarterly*, November, 1897, vol. xix., No. 1.

The Mineral Industry, vol. v. Edited by R. E. Rothwell. (Review.) *School of Mines Quarterly*, November, 1897, vol. xix., No. 1.

Notes on Lead and Copper Smelting and Copper Matte Converting, H. W. Hixon. (Review.) *School of Mines Quarterly*, November, 1897, vol. xix., No. 1.

Investigations

On the Study of the Cooling Curves of Metals and their Corresponding Temperatures. With Mr. G. C. Henning.

Publications by Parker C. McIlhiney, Ph.D.

" A Method of Determining the Resistance of Electrolytes." *Jour. Am. Chem. Soc.*, vol. xx., p. 206, March, 1898.

" Some Experiments in Thermoelectric Pyrometry." Paper read before the American Chemical Society, not yet published.

DEPARTMENT OF MINERALOGY

The courses of instruction as set forth in the circular of information have been carried out; Course VIII, however, somewhat unsatisfactorily, on account of late completion of laboratory. The number of students taking the courses has materially increased, as shown in the following tabulation:

Course	Students Attending			Increase over 1896–97
	1st Class	2d Class	4th Class	
I. Blowpipe Analysis.	34	..	..	12
II. Crystallography.....	34	..	..	12
IV. Mineralogy........	32	23	..	9
V. Minerals of Building Stones......	..	18	..	2
VI. Optical Mineralogy.	..	15	..	0
VIII. Physical Crystallography..........	..	..	2	2

Course I, Blowpipe Analysis, has been made shorter and simpler and more distinctly subordinate to Mineralogy than heretofore; and the gas blowpipe substituted for the oil lamp.

Course II, Crystallography, has been somewhat amplified to include elementary measurements and determinations of physical characters; the purchases of apparatus during the year will make possible a further modification in this direction.

In Course IV, Mineralogy, very little change has been made, the course serving excellently the desired end of imparting eye knowledge and skill in quick determination of the important minerals. In Courses V and VI Dr. Luquer has made many beneficial changes, especially in Course VI, for which he has prepared a needed text-book.

The publications of the officers of the Department, details of graduate work, and change in collection and equipment are stated in the report to the Dean of the Faculty of Pure Science.

DEPARTMENT OF MINING

The personnel of the Department has been changed by the appointment of Frank Cyrus Hooper, Met. Eng., as Assistant in Mining. Mr. Hooper was graduated from the School of Mines in 1890, was assistant engineer with the DeLamar Mining Company in 1890 and 1891, was in the employ of the American Graphite Company at their mines at Ticonderoga in 1892 and 1893, and since that time has been superintendent of the North River Garnet Company. Mr. Hooper thus has had experience in designing, constructing, and operating concentrating and milling plants, and is especially well fitted to take charge of the new mining laboratories of the Department.

The plans for the new laboratories have been worked out in detail, the necessary equipment is on hand, and during the past winter considerable progress was made toward the installation of the machinery. One of the laboratories was so far completed that the work of the students was carried on as usual, including the sampling and testing of a ton of ore by hand-picking, hand-jigging, and vanning; and the test of a gold-bearing gravel by panning. It is intended next winter to have a part of the concentrating machinery, including one or two jigs, a round table, and a Frue vanner, in operation, so that projected additions to the laboratory course can be carried into effect.

When completed these laboratories will include:

The Laboratory for Mechanical Assays will contain small crushers, rolls, and screens, and conveniences for sampling, hand-picking, jigging, and vanning small samples of ore, and for panning gold-bearing gravel. This room was so far equipped last winter that it could be used for the regular laboratory work now required of mining and metallurgical students.

The Laboratory for Working Tests will contain small power-jigs, a hand-jig, a buddle, a frame, a keeve, and other similar apparatus for working a ton or more of ore at a time. This laboratory will be equipped and ready for use next winter.

The Laboratory of Dressing Machinery will contain full-sized machines of standard types, each arranged so that the products, heads, middlings, and tailings are returned at once to the same machine for retreatment. With a small quantity of ore each machine can thus be operated as long as may be necessary, and the student is afforded an opportunity to become familiar with the adjustments of the machine and the tests of proper and successful working. The apparatus now being installed includes a two-sieve jig, a three-sieve jig, and a five-sieve jig, a round table, and a vanner, and the necessary crushing and screening apparatus and classifiers. Part of the machinery of this laboratory has been erected, and it is hoped that it will be available for use next winter.

The Laboratory for Milling Gold and Silver Ores includes a stamp mill, copper plates, pan, and settler, which will be arranged to be run in connection with concentrating apparatus when necessary. The machinery for this laboratory is on hand, but it is hoped that it may prove possible to replace it with machinery of better design, especially adapted to the experimental work contemplated, before the time comes for its erection.

These laboratories are not intended to replace the careful study of mining methods and of the operations of ore-dressing at the mines and dressing works in connection with the summer school of mining, but are intended to supplement such study, and in particular to afford opportunities that cannot be obtained at the mines. When completed these laboratories will be unique in many respects, and in advance of anything yet attempted at any mining school, and will afford unequalled opportunities for study and research.

The Summer School of Practical Mining was held in the Lake Superior iron and copper regions, with headquarters at Ishpeming, at the mines of the Pittsburg and Lake Angeline Iron Company. Professor Peele was assisted in the work of the summer school by Mr. A. J. Campbell, Ph.B., E.M., and by Mr. George S. Brackett, E.M., the former having full charge of the underground surveying. Both men proved eminently satisfactory, and we have been so fortunate as to secure the services of Mr. Campbell again this summer.

The class numbered seventeen. Fourteen of these were members of the Fourth class, and three were graduate students intending to enter the School of Mines in the fall. Two of the latter are from Stevens Institute, and one from Johns Hopkins University.

The class arrived at Ishpeming under the charge of Mr. Van Ingen, as detailed in the report of the Department of Geology. After a few days occupied by field geology, the regular class work was opened on June 7th, at the east mine of the Lake Angeline Co. The detail work, underground and on surface, being completed at the east and west Angeline mines, short visits were made to the Lake mine of the Cleveland Cliffs Iron Co., and to Section 16 mines of the Lake Superior Co. A cordial welcome and every facility were extended to us by the officers of the Lake Angeline Co. As their east mine has been open only five or six years, its state of development and the condition of its workings are such as to render it particularly well adapted to our needs. Not so large as to confuse a beginner, it has, notwithstanding, plenty of ground open to permit the carrying on of class-room work without in any way inconveniencing or obstructing the mine operations. The top-slice caving system of mining is in use at this mine, which is producing 1200 to 1300 tons of ore per day. At the west mine, of the same company, a composite system has been employed. The soft ore of this mine was opened up originally by room and pillar. All the rooms have been exhausted, and the pillars are now being mined by an adaptation of the caving system. The hard ore, occurring in a portion of the west mine, is worked by large inclined "raise stopes." In the adjoining mine, owned by the Lake Superior Co., the class had an opportunity to see chamber mining on a large scale. The Cleveland Lake mine, visited last, furnishes an example of room and pillar working carried out with excessive regularity, but not with entire success.

The mine surveying was done in a part of the Lake Angeline mine. It comprised an underground traverse, plumbing in a 75 ft. vertical winze, carrying the line through an inclined winze and an inclined shaft, and two of the squads closed their lines on the surface. This gave some very good practice, involving most of the problems commonly met in underground surveying. The new Buff and Berger transit was found to be very satisfactory to both instructor and students.

Four weeks were spent in the above-mentioned work. The class then went to Houghton, Mich., from which town, as headquarters, trips were made to the Atlantic mine and new mill, the surface plants of the Calumet and Hecla and Tamarack mines and the Calumet and Hecla mills. Voluntary visits were made also by most of the class, either to Cooper's copper-smelting works at Hancock, or the surface plant of the Quincy mine.

On July 9th the class left for Chicago, to join Mr. Struthers for a visit to the smelters, as detailed in the report of the Department of Metallurgy.

DEPARTMENT OF PHYSICS

During the summer of 1897, the apparatus belonging to the Department of Physics was transferred to the new site, and considerable time was expended in its arrangement. The Department is now much better provided with facilities for work, and particularly with a larger amount of room. On the fourth floor are three large laboratories devoted to general physics, optics, and acoustics, and also a photographic dark room and two smaller laboratories for special researches. On the third floor there are two lecture rooms, a private laboratory, the library of the Department, and a large room containing the apparatus for lecture demonstrations. On the second floor are large electrical and optical laboratories and also a workshop fitted with the usual appliances. On the first floor, finally, there are three rooms adapted for special researches. The building has been arranged so as to contain a vertical shaft 90 feet high, which can be utilized for certain gravitation experiments. On the roof of the building the fine meteorological apparatus, presented to the University by President Low, is mounted and the records are obtained electrically in the library of the Department on the third floor.

The statement which follows with regard to the instruction given to the students in the Schools of Applied Science is arranged under separate heads, and will, it is believed, be easily intelligible.

LECTURE COURSES

Course I—General Physics, Sound and Heat (first half-year), Light and Electricity (second half-year).
Professor Rood and Mr. Gordon.
First-Year Class (except students in School of Architecture) 97

Course III—Electricity and Exact Electrical Measurements.
Professor Hallock.
Second-Year Class.......................... 73

Course V—Modes of Designing and Constructing Apparatus.
Professor Hallock.
Students attending optionally............... 7

Course VI—Elementary Meteorology.
Mr. Gordon.
Students attending optionally 5

Course VII—Electrical Manipulation and Comparison of Electrical Methods.
Mr. Parker.
Second-Year Students in the course of Electrical Engineering 20

LABORATORY STUDENTS

Second-Year Students.	
Mining, Engineering, and Metallurgy	11
Chemistry	8
Civil Engineering	19
Electrical Engineering	41
First-Year Students.	
Mechanical Engineering	13
Chemistry	3
Total	95
Fourth-Year Students.	
Engaged in special thesis work	2

During the year spacious laboratories of the Department in Fayerweather Hall have been equipped with the apparatus belonging to the Department and a number of new pieces have been added, including a complete set of projection apparatus for the lecture room, new galvanometers and resistances boxes for the Electrical Laboratory. The usual number of papers on scientific subjects by members of the Department have been published during the year, and several important investigations are now in progress.

At the commencement of the year two new assistants were appointed to the staff of the Department, Frank L. Tufts, Ph.D., and William S. Day, Ph.D. In the early part of the spring the resignation of Dr. Henry E. Keyes, Assistant, was received, and to fill the vacancy Mr. William C. Andrews, E.E., a graduate of the School of Mines of the Class of 1895, was appointed.

CONCLUSION

The work in all the Schools under this Faculty has been most satisfactory. Both the students and their instructors have felt stimulated by their surroundings at the new site, and by the complete and perfect equipment of the new buildings. While the laboratory work in some departments was delayed for a few weeks at the beginning of the year as a consequence of the removal, the students accommodated themselves to the situation, and cheerfully made up for lost time by extra diligence. With few exceptions, therefore, the work of the year was carried out on schedule time and as fully and completely as in other years.

Respectfully submitted,
HENRY S. MUNROE,
Dean.

SCHOOL OF POLITICAL SCIENCE

REPORT OF THE DEAN

FOR THE ACADEMIC YEAR ENDING JUNE 30, 1898.

To the President of Columbia University
in the City of New York:

SIR:

I have the honor to submit the following report of the work of the Faculty of Political Science for the scholastic year 1897–98. During the year, 310 students have taken courses of instruction under the Faculty of Political Science. Of these, 162 were also registered in the Law School, 28 in the School of Philosophy, 1 in the School of Pure Science, 33 were members of the College, 3 of the School of Applied Science, and 19 pursued studies in the Union Theological Seminary. Of the 310 students taking courses in the School of Political Science, 220 held college degrees on entrance, and 33 had completed the Junior year of the College.

Of the 220 students holding college degrees upon entrance into the School,

166 had the degree of Bachelor of Arts.
33 " " " " " " Science.
11 " " " " " " Philosophy.
6 " " " " " " Letters.
2 " " " " " " Divinity.
3 " " " " " " Laws.
33 " " " " Master " Arts.
2 " " " " " " Science.
4 " " " " Doctor of Philosophy.
1 " " " " Electrical Engineer.
1 " " " " Civil Engineer.
1 " " Testimonium Maturitatis.

263
Deduct 43 for students holding more than one degree.

220

Students in the School received their degree, or degrees, from the following institutions:

Adelbert College	4
Allegheny College	1
Amherst College	6
Blackburn College	1
Bowdoin College	1
Brown University	6
Centre College, Kentucky	1
Colgate University	1
College of the City of New York	28
Columbia University	40
Cornell College, Iowa	1
Cornell University	1
Cumberland University	4
Curry University	2
Dartmouth College	1
Dickinson College	2
Drake University	1
Edinburgh University, Scotland	2
Emory College	2
Eureka College	1
Franklin and Marshall College	3
Franklin College, Indiana	1
General Theological Seminary	1
Hamilton College	1
Hanover College	2
Harvard University	13
Haverford College	1
Hobart College	6
Iowa College	1
Iowa Wesleyan University	1
Johns Hopkins University	1
Knox College	1
Lafayette College	2
Lebanon Valley College	1
Leland Stanford Junior University	2
Lenox College	1
McGill University	1
Mac Minnville College	1
Marietta College	1
Massachusetts Institute of Technology	1
National Law School	1
New York University	6
Oberlin College	2
Odessa Gymnasium	1
Ohio Wesleyan University	2
Oxford College	1

Parsons College	1
Pennsylvania Military College	1
Polytechnic Institute of Brooklyn	2
Princeton University	9
Ripon College	1
Roanoke College	3
Rutgers College	4
Seton Hall College	2
State University of Iowa	1
State University of Missouri	1
St. Francis Xavier College	4
St. John's College, Fordham	2
St. John's College, Maryland	1
St. Stephen's College	1
Trinity College, Texas	1
University of California	2
University of Chicago	2
University of Georgia	1
University of Halle, Germany	1
University of Havana	1
University of Kansas	1
University of Louisiana	1
University of Michigan	8
University of Minnesota	5
University of North Carolina	1
University of North Dakota	1
University of Rochester	4
University of Tennessee	1
University of West Virginia	1
University of Wisconsin	4
University of Wooster	1
Vanderbilt University	2
Washington University	1
Wesleyan University, Connecticut	3
West Virginia Conference Seminary	1
Williams College	8
Wofford College	1
Yale University	15
Total number of degrees	263

Inasmuch as we have, at Columbia, made the beginning of the Senior year the commencement of the University work, we must add to the 220 students having degrees, the 33 other students who have completed the Junior year. There are then 253 University students in full standing, who have done work during the present year under the Faculty of Political Science.

COURSES OF INSTRUCTION

GROUP I.—HISTORY AND POLITICAL THEORY

A.—European History

Instructor	Courses	Hours per Week	Total Number of Students
Prof. Sloane	1. History 12. Napoleonic Epoch	2	8
Prof. Robinson	2. History 11. Investigation; course in Mediæval Culture; Institutions	2	4
Prof. Robinson	3. History 8. Introductory Course; the Renaissance and Reformation	2	2
Prof. Osgood	4. History 15. English Constitutional History	2	14
Prof. Robinson	5. Seminar in European History	1	6
	B.—American History		
Prof. Burgess	1. History 23. Political and Constitutional History of the United States	2	51
Prof. Sloane	2. History 7. Transition Epoch in American History	2	59
Prof. Sloane	3. History 29. War of 1812	2	2
Prof. Osgood	4. History 24. Political History of the Colonies and of the American Revolution	2	9
Prof. Dunning	5. History 25. Civil War and Reconstruction	1st half-year 2	15
Prof. Osgood	6. Preliminary Seminar in American Colonial History	1	10
	C.—Political Theory		
Prof. Dunning	1. History 40. Political Theories	2	40
Prof. Dunning	2. Seminar in Political Theories	1½	4

GROUP II.—PUBLIC LAW AND COMPARATIVE JURISPRUDENCE

Instructor	Courses	Hours per Week	Total Number of Students
	A.—Constitutional Law		
Prof. Burgess	1. Comparative Constitutional Law of the Principal European States and of the United States	2	37
Prof. Burgess	2. Seminar in Comparative Constitutional Law	1	25
	B.—International Law		
Prof. Moore	1. History of Diplomacy	1st half-year 2	1
Prof. Moore	2. History of American Diplomacy	2d half-year 2	4
Prof. Moore	3. International Law	2	18
Prof. Moore	4. Seminar in Diplomacy and International Law	1	2
	C.—Criminal Law		
Prof. Moore	1. Criminal Law	2	137
	D.—Administrative Law		
Prof. Goodnow	1. Comparative Administrative Law of the United States and of the Principal European States	2	40
Prof. Goodnow	2. Law of Taxation	1	2
Mr. Kelly	3. Municipal Politics	2d half-year 2	23
Prof. Goodnow	4. Seminar in Administrative Law	1	5
	E.—Roman Law and Comparative Jurisprudence		
Prof. Munroe Smith	1. Roman Law 1	1st half-year 2	9
Prof. Munroe Smith	2. Roman Law 2	2d half-year 2	5
Prof. Munroe Smith	3. History of European Law	2	5
Prof. Munroe Smith	4. International Private Law	1	5
Prof. Munroe Smith	5. Seminar in Legal History	1	5

GROUP III.—ECONOMICS AND SOCIAL SCIENCE

A.—Political Economy and Finance

Instructor	Courses	Hours per Week	Total Number of Students
Prof. Mayo-Smith..1.	Political Economy 3. Historical and Practical Political Economy....	3	67
Prof. Mayo-Smith..2.	Readings in Marshall's Economics...........	1	8
Prof. Seligman.....3.	Political Economy 4. Taxation and Finance.	2	44
Prof. Seligman.....4.	Political Economy 5. Financial History of the United States.....	1st half-year 2	21
Prof. Seligman.....5.	Political Economy 5. Railroad Problems....	2d half-year 2	24
Prof. Clark........6.	Economics 9. Natural Standards; Wages and Interest...	1st half-year 2	10
Prof. Clark........7.	Economics 10. Distribution as Affected by Industrial Changes.	2d half-year 2	8
Prof. Clark........8.	Economics 11. Socialism............	1st half-year 2	10
Prof. Clark........9.	Economics 12. Social Reforms.......	2d half-year 2	5
Profs. Seligman and Clark........10.	Seminar in Political Economy and Finance.	2½	12

B.—Sociology and Statistics

Prof. Mayo-Smith..1.	Statistics and Sociology.................	1st half-year 2	7
Prof. Mayo-Smith..2.	Theory and Technique of Statistics..........	2d half-year 2	12
Prof. Mayo-Smith..3.	Statistical Laboratory and Seminar.........	fortnightly	5
Prof. Giddings.....4.	Sociology 20. General Sociology....	1st half-year 2	43
Prof. Giddings.....5.	Sociology 21. Progress and Democracy................	2d half-year 2	34
Prof. Giddings.....6.	Sociology 22. Pauperism, Poor-Laws, and Charities.........	1st half-year 2	20

Instructor	Courses	Hours per Week	Total Number of Students
Prof. Giddings.....7.	Sociology 23. Crime and Penology...	2d half-year 2	19
Prof. Giddings....8.	Seminar in Sociology..	fortnightly	17
Dr. Ripley........9.	Ethnology and Anthropology....	1st half-year 2	11
Dr. Bayles.......10.	Civil Aspects of Ecclesiastical Organizations in the United States...	2d half-year 2	5

SEMINAR IN EUROPEAN HISTORY

Professor Robinson. 2 hours fortnightly. 6 members.

The year was devoted to a critical study of Dante's *Il Convito* and Peter Dubois's *De Recuperatione Terre Sancte.*

Attended by 4 students. Reports were read as follows:

John of Salisbury........................	Allen Johnson.
Albert the Great..........................	F. R. North.
Vincent of Beauvais and his Encyclopedia..	A. L. P. Dennis.
Thomas Aquinas's Scientific and Political Writings............................	C. E. Merriam, Jr.

PRELIMINARY SEMINAR IN AMERICAN HISTORY

Professor Osgood. 1 hour a week. 10 members.

The period to which attention has been specially devoted in this course is the latter half of the 17th century. Master's theses have been prepared, read, and discussed by the following students, and on the subjects stated below:

Bacon's Rebellion in Virginia...........	W. Thomas Kemp.
Proprietary Government in New Jersey..	Louis Becker.
The Recall of the Massachusetts Charter in 1684.............................	William Henry Fry.
The Settlement of Pennsylvania........	Eugene E. Spiegelberg.
The Revolt of 1689 and 1690 in Massachusetts and New York	J. Herbert Deignan.
The Imperial Policy of Great Britain during the 17th Century................	M. Lincoln Strauss.
Cotton Mather as a Representative of New England Puritanism.................	William L. Levy.
Origin of the Conflict between the English and French in America..............	Charles A. Son.
Constitutional Relations between England and her Colonies	Alexander Bing.

Part of the work done by Professor Sloane was in the nature of seminar work. Four papers were read before the class by students on the following subjects:

The Relation of Parties in European Politics during the First Decade of the Century.
Napoleon and the Orient.
The Foreign Policy during Washington's Administration.
Napoleon after Toulon.

SEMINAR IN POLITICAL THEORIES

Professor Dunning. 1½ hours a week. 4 members.

The work of the year consisted in the main in the critical reading of Willoughby's *Nature of the State*. After completing this work papers were prepared and read by members of the Seminar as follows:

The State in Relation to Law	M. Werdenschlag.
The State in Relation to Nationality	E. A. Bayles.
The State in Relation to Justice	E. W. Lamson.
The Personality of the State	C. E. Merriam.

SEMINAR IN COMPARATIVE CONSTITUTIONAL LAW

Professor Burgess. 1 hour a week. 25 members.

The work of the year has consisted of a study of the cases interpreting the Fourteenth Amendment of the Constitution of the United States. Twenty-five students have taken part in the work, each of whom has written a critique upon one or more of these cases and has participated in the discussion of all of them.

SEMINAR IN DIPLOMACY AND INTERNATIONAL LAW

Professor Moore. 1 hour a week. 2 members.

The following papers were read:

Reprisals	Nathan O. Petty.
The Neutralization of International Communication	Alfred Roelker, Jr.

SEMINAR IN ADMINISTRATIVE LAW

Professor Goodnow. 1 hour a week. 5 members.

Subject of investigation: The Centralization of State Administration in the United States.

The following students read papers, most of which occupied a number of sessions of the Seminar.

Centralization of Excise in the United States.	C. M. L. Sites.
Public Administration in the United States..	R. H. Whitten.
Centralization of Administration in New York	J. A. Fairlie.
State Boards of Health	C. H. Tiebout, Jr.
State Boards of Charities	Millard R. Ellison.

SEMINAR IN LEGAL HISTORY

Professor Munroe Smith. 1 hour a week. 5 members.

The work of the year consisted in reading texts upon theft and the law of movable property, from the Digest of Justinian.

The Lex Salica.
The Leges Langobardorum.
The Sachsenspiegel.
The French Codes.

Investigations were carried on by Mr. McKeag upon quasi contractual obligations, and by Mr. Platt upon the movement of legislation regarding marriage and divorce.

SEMINAR IN POLITICAL ECONOMY AND FINANCE

Professor Seligman. Fortnightly. 12 members.

The following papers were read:

Economics in Russia	N. I. Stone.
Local Taxation in England	B. H. Ames.
Local Taxation on the Continent	R. L. Ashel.
Theory of Benefit in Taxation	W. B. Cutright.
Local Taxation in the United States	R. McCrea.
Reports of Recent Tax Commissions	E. L. Bogart.
Theory of Monopoly Prices	W. M. Burke.
History of Monopoly	M. Birnbaum.
Effects of Monopoly	J. E. Pope.
The Control of Monopoly	F. Johnson, Jr.
Certain Theories of the English Income Tax...	A. P. Chase.

Each of the members furthermore made a report on the periodical literature of his subject.

In addition to the students mentioned in the above list, Messrs. Merriam and Howard, who no longer attend lectures at Columbia, and who have not yet taken their degree, attended the Seminar and participated in the discussions. Several of these students have made considerable progress with their dissertations for the degree of Doctor of Philosophy.

SEMINAR IN ECONOMIC THEORY

Professor Clark. Fortnightly. 2½ hours.

Papers were read as follows:

Theories of von Thünnen	J. E. Pope.
The Wages-Fund Theory, to the Time of John Stuart Mill	R. C. McCrea.
The Wages-Fund Theory, since the Time of John Stuart Mill	William Burke.
Labor Movements before the French Revolution.	S. S. Wallace.
Socialistic Experiments in the United States	B. W. Wait.
The Farmers' Movement in the United States	E. L. Bogart.
Sympathetic Strikes	F. S. Hall.
Employers' Liability in the United States and Great Britain	M. Birnbaum.

In addition to these papers general discussions were held before the Seminar on monopoly prices, taxation, and other subjects.

STATISTICAL LABORATORY AND SEMINAR

Professor Mayo-Smith. Fortnightly. 2 hours. 5 members.

The students were engaged the first half-year in the analysis of the Statistics of Population contained in the volume on Population in the Eleventh Census of the United States. During the second half-year special studies were made of the Statistics of Occupations and Wages, and papers were read by the following members:

The Classification of Occupations	Mr. Bogart.
The Employment of Children in Factories	Mr. Chase.
The Statistics of Agriculture in the United States	Mr. Stone.
The Statistics of Wages in England and in the United States	Mr. Miller.
The Statistics of Wages in the Massachusetts Reports of the Bureau of Statistics of Labor	Mr. Chase.
The Aldrich Report	Mr. Stone.
The Employment of Women in Factories in England and in the United States	Mr. Bissell.

SEMINAR IN SOCIOLOGY

Professor Giddings. Fortnightly. 2 hours. 17 members. In addition to numerous short papers and reports the following papers were read and discussed:

The Ephrata Community of Seventh-Day Baptists in Pennsylvania	A. V. Hiester.
The Poor-Law System of New York during the Colonial Period	W. E. Miller.
A Sociological Study of the Western Reserve	J. H. Dynes.
The Early Economic System of South Carolina	W. A. Schaper.
The Negro in New York City	J. H. Clyde.
The Expenditure and Economy of the Self-Supporting Poor	T. G. Shearman, Jr.
The History of Private Charity	H. C. McComas.
The Reception of Immigrants at the Port of New York	H. Jeschke.

During the year the following gentlemen have held Fellowships in subjects falling under the jurisdiction of this Faculty:

1. William Maxwell Burke . . Political Economy.
   Oberlin College, A.B., 1896; A.M., 1897.
   Subject of investigation: Central Labor Unions.
   Mr. Burke has not only finished the collection of his material, but has put part of it into shape. He has read before the Seminar a part of the dissertation on this subject which he intends to submit for the Doctor's degree. He has also participated in the general work of the Seminar, having read short papers on "The Wages-Fund Theory since the Time of John Stuart Mill," and "The Theory of Monopoly Prices."
2. John Archibald Fairlie . . Administration.
   Harvard College, A.B., 1895; A.M., 1896.
   Subject of investigation: The Centralization of Administration in Massachusetts.

Mr. Fairlie has read before the Seminar the dissertation on this subject which he expects to present as a part of the qualification for the Doctor's degree in May, 1898. He has also attended the Seminar in Political Economy.

3. Allen Johnson . . European History.

Amherst College, A.B., 1892; A.M., 1895.

Subject of investigation: The Intendent as a Political Agent under Louis XIV.

Mr. Johnson presented a report on "John of Salisbury." He has attended the Seminar in Napoleonic History, where he presented a paper on "Napoleon, from the Siege of Toulon to 1796."

4. Charles Edward Merriam, Jr. . . Political Philosophy.

Lenox College, Iowa, A.B., 1893;
Iowa State University, A.B., 1895;
Columbia University, A.M., 1897.

Subject of investigation: The Theory of Sovereignty since Rousseau.

Mr. Merriam has made a detailed analytical study of a number of the less accessible philosophers of the Renaissance period, including, particularly, Manilius of Padua and Suarez. He also contributed important discussions on Willoughby's *Nature of the State* in the Seminar, and read a paper on "The Personality of the State."

5. William August Schaper . . Sociology.

University of Wisconsin, B.L., 1895;
Columbia University, Scholar in Sociology, 1896–97.

Subject of investigation: Sectionalism and Representation in South Carolina.

A part of this paper was read in the Seminar under the title of "The Early Economic System of South Carolina."

Mr. Schaper also visited and examined all the social settlements in New York City, and has prepared a history of their work to the present date.

6. Clement Moore Lacey Sites . . Constitutional Law.
   Ohio Wesleyan University, A.B., 1887; A.M., 1890;
   Columbian University, LL.B., 1890.
   Subject of investigation: Excise Administration in the United States.
   Mr. Sites read before the Seminar in Administration the dissertation on this subject which he intends to present next fall as a part of the qualification for the Doctor's degree.
7. Robert Harvey Whitten . . Administration.
   University of Michigan, B.L., 1896;
   University of Chicago, 1896–97.
   Subject of investigation: Public Administration in Massachusetts.
   Mr. Whitten read before the Seminar in Administration the dissertation on this subject which he intends to present, May, 1898, as a part of the qualification for the Doctor's degree.
8. John Howard Dynes . . Sociology.
   Adelbert College, A.B., 1891;
   Western Reserve University, 1894–95;
   Harvard, 1895–96;
   Columbia University, 1896–97.
   Subject of investigation: The Western Reserve of Ohio.
   Mr. Dynes read before the Seminar in Sociology a paper on this subject of investigation, entitled "A Sociological Study of the Western Reserve." He has visited during the year all the social settlements in New York City, and has prepared an account of his work.
9. Anselm Vinet Hiester . . Sociology.
   Fellow in Sociology, 1897–98.
   Subject of investigation: The November Election Returns in Pennsylvania; and the Political History and Affiliations of the Pennsylvania Germans. He read a paper before the Seminar on this subject, entitled "Pennsylvania Germans."

The Studies in History of Economics and Public Law, edited by the Faculty of Political Science, have been continued. During the academic year the following additional numbers have appeared:

Public Administration in Massachusetts: The Relation of Central to Local Activity.............Robert Harvey Whitten, Ph.D.
German Wage Theories: A History of their Development. James Walter Crook.
Centralization of Administration in New York. John Archibald Fairlie, Ph.D.

These numbers complete Volume IX of the Series.

In addition to these, second editions have been published of the following monographs:

The Divorce Problem: A Study in Statistics. Walter I. Wilcox, Ph.D.
A History of Tariff Administration in the United States from Colonial Times to the McKinley Administrative Bill. John D. Goss, Ph.D.
History of Municipal Land Ownership on Manhattan Island. John Ashton Black, Ph.D.
Special Assessments: A Study in Municipal Finance. Victor Rosewater, Ph.D.

The sale of the monographs continues to increase from year to year, and it is proposed to issue second editions of several other monographs during the coming academic year.

WORK IN HISTORY, ECONOMICS, AND SOCIOLOGY AT BARNARD COLLEGE

Professor Osgood's advanced course, of two hours a week throughout the year, in American Colonial History, has been attended by three students. In connection with this course, Frances S. Belcher prepared a Master's thesis on "The Administration of Sir Edmund Andros in New York and Massachusetts."

Professor Osgood has also given a course in English Constitutional History, of two hours throughout the year, which was attended by four students.

Professor Robinson gave a course on the Renaissance and the Reformation, of two hours a week throughout the year, which was attended by fourteen students. The Seminar conducted by Professor Robinson was attended by four students.

Professor Clark's course in Socialism, two hours a week, first half-year, and on Social Reform, two hours a week, second half-year, was attended by four students, and in the Seminar a paper was read on "Socialism in England."

Professor Mayo-Smith gave a course, of two hours a week during the first half-year, on the Problems of Exchange. Sixteen students attended.

Professor Seligman gave a course of two hours a week during the second half-year, on the History of Political Economy. Ten students attended. A third hour of this course was taken by Mr. Day.

Professor Giddings's courses in General Sociology and on Progress and Democracy, two hours a week throughout the year, were attended by thirteen graduate students, and the Seminar exercises were conducted bi-weekly throughout the year. Thirteen meetings of the Seminar were held and were attended by the following students:

Miss Carpenter......New York State's Treatment of its Insane.
Miss Eaton.........Occupations of Negro Wage-Earners in the City of Philadelphia.
Miss Hurd..........The General Condition of Women Wage-Earners.
Miss Minturn........A Comparison of the Labor Laws of Massachusetts and Georgia.
Miss Sebring........Individual and Social Interests in Education.
Miss Shaw..........The Relative Severity of the Marriage and Divorce Laws of the Different States in the Union.
Miss Taber..........The Frequency and Alleged Causes of Strikes and Lockouts.

The *Political Science Quarterly* seems now to have entered upon a period of increasing usefulness. It has lived through a number of years of sharp competition, caused by the establishment of like periodicals at other universities. For a few years its circulation decreased somewhat. I am now happy to state that it is again steadily increasing. It is certainly holding its own from a scientific point of view also. Ample proof of this comes to us continually from the favor in which it is held by the best publicists and jurists of this country and of Europe.

The reorganization of the Academy of Political Science is progressing slowly, but with good promise. Quite a large number of persons have become connected with it during the past year, as Associate members and as Student members. Several scientific meetings have been held, at which instructive papers have been read, and interesting discussions have taken place. It is intended and expected that scientific meetings will be held monthly during the coming year.

I cannot close this report without adverting to the great comfort and advantages under which the work of the year has been pursued. In our old quarters at Forty-ninth Street, we were not only cramped, at every turn, for room, but the noise made it very difficult for our students to hear the whole of any lecture, paragraph, or even sentence. With the ample and quiet quarters which we now enjoy for administration rooms, lecture rooms, Seminar rooms, and reading-rooms, it is not extravagant to say that the accuracy of the scholarship of our students has been very greatly enhanced, as well as the quantity of their knowledge increased.

We do not forget that this has come about chiefly through the great generosity of the President, in the gift of the splendid building in which this Faculty and School are so comfortably and advantageously housed. It gives us all very great pleasure to testify thus to the exceeding value of his noble work in the making of sound and accurate scholarship.

Very respectfully submitted,
JOHN W. BURGESS,
Dean.

SCHOOL OF PHILOSOPHY

REPORT OF THE DEAN

FOR THE ACADEMIC YEAR ENDING JUNE 30, 1898.

To the President of Columbia University
in the City of New York:

SIR:

I have the honor to submit herewith the eighth annual report on the work of the Faculty of Philosophy. This report covers the academic year ending June 30, 1898. The various courses of instruction and research offered by the Faculty, together with a statement of the attendance upon each, are summarized in the accompanying tabular view marked A. A list of the University Fellows appointed in the departments falling under the jurisdiction of this Faculty, together with an outline of the special work of each during the year, will be found in the accompanying statement marked B. A list of the recommendations for University degrees made by this Faculty during the year is given in the statement marked C.

During the year the number of students pursuing their studies either wholly or in part under the direction of this Faculty has been 255, a decrease as compared with the preceding year of 8, or 3.04 per cent. The composition of the list of students is as follows:

1. Candidates for the degree of Bachelor of Arts:		
Seniors in Columbia College	38	
Seniors in Barnard College	23	
Total		61
2. Students holding a bachelor's degree, or its equivalent from a foreign institution:		
Men	128	
Women—registered through Barnard College	37	
		165
3. Not included in the above classes		29
		255

Of the number of students enrolled under the Faculty, 41 were students in the theological seminaries of New York, admitted in accordance with the resolutions of the Trustees passed April 7, 1890. Of this number, 29 came from the Union Theological Seminary, 8 from the General Theological Seminary, and 4 from the Jewish Theological Seminary. This is a decrease, compared with last year, of 9 students from Union Seminary, and an increase of 3 from the Jewish Seminary.

The number of auditors enrolled during the year was 33, an increase of 8 over 1896–97. Of this number, 13 attended courses in Philosophy; 5, courses in Education; 8, courses in Psychology; 17, courses in English; 4, courses in Literature; 1, courses in Semitic Languages; 3, courses in Romance Languages; and 1, courses in Latin.

The degrees held by the 172 graduate students were as follows:

Degrees signifying a liberal or general education:		
Bachelor of Arts	136	
Bachelor of Philosophy	9	
Bachelor of Science	17	
Bachelor of Literature	6	
		168
Degrees signifying a technical or professional education:		
Bachelor of Divinity	3	
Bachelor of Laws	2	
Bachelor of Pedagogy	1	
Civil Engineer	1	
Electrical Engineer	1	
		8
Advanced degrees:		
Master of Arts	41	
Master of Science	2	
Doctor of Medicine	1	
Doctor of Philosophy	1	
		45
Total		221
Deduct for students holding more than one degree		49
		172

The 172 students holding degrees represented the following colleges and universities:

Adelbert College	1
Albion College	1
Alfred University	1
Amherst College	1
Amity College	1
Brooklyn Polytechnic Institute	2
Brown University	6
Bryn Mawr College	1
Buchtel College	1
Centre College (Ky.)	1
Cincinnati University	1
Colgate University	3
College of the City of New York	14
Columbia College	51
Cornell College (Ia.)	1
Cornell University	2
Cumberland University	4
Dartmouth College	1
Dickinson College	1
Franklin and Marshall College	1
General Theological Seminary	1
Harvard University	10
Hiram College	1
Hobart College	1
Illinois State University	2
Indiana State University	1
Iowa College	1
Iowa State University	1
Iowa Wesleyan University	1
Johns Hopkins University	2
Kansas State University	1
Lafayette College	3
Lake Forest University	1
Lenox College	1
Lincoln University	1
London University	1
Middlebury College	1
New York University	1

Oberlin College	1
Princeton College	8
Radcliffe College	1
Rutgers College	1
St. John's College	1
Smith College	6
State Normal College, Albany, N. Y	1
Swarthmore College	2
Toronto University, Canada	3
Trinity College, Hartford, Conn	1
Trinity College, Toronto	1
Trinity University, Texas	1
University of Chicago	1
University of France	1
University of Lausanne	1
University of Michigan	1
University of Minnesota	2
University of North Carolina	1
University of Tennessee	1
University of Utah	1
University of Vermont	2
University of Virginia	1
University of Wisconsin	3
Urmi College	1
Vanderbilt University	3
Vassar College	9
Wabash College	1
Washington College	1
Washington and Jefferson College	1
Wellesley College	3
Wesleyan University, Conn	3
Whitworth College	1
Williams College	4
Wittenberg College	2
Wooster University	2
Yale University	5
74 institutions Total	203
Deduct for duplication	31
Total	172

At the close of the year 40 candidates for the degree of Bachelor of Arts were certified to the Faculty of the College as having satisfactorily completed such work as they had undertaken with the Faculty of Philosophy.

The number of courses given during the year 1897–98 by the several departments represented in this Faculty, as compared with those of the previous year, was as follows:

	Number of Courses	Increase	Decrease
Philosophy, Psychology, and Education	21	—	4
Greek	8	—	2
Latin	8	—	2
English	7	1	—
Literature	5	—	2
Rhetoric	5	1	—
Germanic Languages	11	3	—
Romance Languages	12	—	3
Oriental Languages	11	—	3
Indo-Iranian Languages	9	3	—
Linguistics	—	—	1
Music	4	3	—
Totals	101	11	17
			11
Net decrease			6

In the following table is given a comparative statement of the enrolment under this Faculty since its foundation:

	1890–1	1891–2	1892–3	1893–4	1894–5	1895–6	1896–7	1897–8
Total enrolment	92	130	130	165	190	227	263	255
Number holding degrees	52	56	62	92	120	147	131	165
Per cent	56.5	43.0	47.7	55.7	63.1	65.2	49.9	64.3
Seniors in Columbia College and students of equivalent standing	32	41	58	55	51	62	74	61
Per cent	34.8	31.5	46.6	33.3	26.9	27.3	28.1	23.9
Not included in either of the above	8	33	10	18	19	17	58	29
Per cent	8.7	25.5	5.7	11.0	10.0	7.5	22.0	11.8

The number of Seniors in the College electing courses in Philosophy, Philology, and Letters each year has been as follows:

	1890–1	1891–2	1892–3	1893–4	1894–5	1895–6	1896–7	1897–8
Number in Senior class	49	50	71	70	49	56	59	49
Number electing studies in Philosophy, Philology, and Letters	32	38	57	55	41	44	53	40
Per cent	65.3	76.0	80.3	78.6	83.7	76.6	90.0	81.6

The total number of Seniors in Barnard College electing courses in the Faculty of Philosophy was 22, the entire membership of the Senior class. Their courses were distributed among the several departments as follows:

Philosophy and Education	29
Psychology	3
Greek	10
Latin	7
Romance Languages	9
Germanic Languages	4
English	18
Rhetoric	10
Hebrew	3
Indo-Iranian	2

The following extracts from the Minutes of the Faculty record the most important legislation of the year:

(Nov. 12, 1897)—*Resolved*, That the University Council be requested to consider the question of the proper disposition to be made of essays for the degree of Master of Arts.

(Feb. 11, 1898)—*Resolved*, That in the opinion of this Faculty, Education should be made the equivalent of a major and one minor subject, and that the University Council be requested to amend the regulations concerning the higher degrees to this effect.

The following list of former students under this Faculty who have been appointed to teaching positions, includes all those, in addition to the list given in the last Report, that have been brought to the attention of the Dean. While the list makes no pretence to completeness, it indicates in a measure how numerous and widely distributed are the teaching positions held by our students and graduates:

Charles Sears Baldwin, Ph.B., 1894.
Assistant Professor of Rhetoric, Yale University.

Ludwig Bernstein, Ph.D., 1897.
Instructor in German, Boys' High School, New York, N. Y.

Victor S. Clark, Ph.D., 1898.
Instructor in English, Boys' High School, Brooklyn, N. Y.

Isabel Eaton, A.M., 1898.
Teacher in the Public Schools, New York, N. Y.

Shepherd Ivory Franz, A.M., 1894.
Assistant in Psychology, Columbia University.

Abel Joel Grout, Ph.D., 1897.
Instructor in the State Normal School, Plymouth, N. H.

Henry Eugene Houston, A.B., 1895.
Teacher in Public Schools, Passaic, N. J.

Henry Budd Howell, A.M., 1897.
Superintendent of Schools, Phillipsburg, N. J.

Adam Leroy Jones, Ph.D., 1898.
Assistant in Philosophy, Columbia University.

Alexander von Wolffersdorff Leslie, Graduate student, 1896–98.
Professor of Greek and English, Hamline University, St. Paul, Minn.

John Angus MacVannel, Ph.D., 1898.
Instructor in Psychology and Education, Pratt Institute, Brooklyn.

Leonard Beecher McWhood, A.B., 1893.
Assistant in Music, Columbia University.

Max Margolis, Ph.D., 1891.
Assistant Professor of Semitic Languages, University of California, Berkeley, Cal.

Walter Taylor Marvin, A.M., 1893.
Assistant in Philosophy, Columbia University.

Elizabeth F. Nammack, A.M., 1896.
Instructor in Latin, Girls' High School, New York, N.Y.

Hugo Radau, Ph.D., 1898.
Instructor in Semitic Languages, General Theological Seminary, New York.

Albert Schneider, Ph.D., 1896.
Professor of Botany, Northwestern University, Evanston, Ill.

Edward Barker Scoggan, Graduate student, 1897–98.
Professor of Ancient Languages, Dickinson Seminary, Williamsport, Pa.

Emma Goodeve Sebring, A.M., 1894.
Principal of St. Agatha School, New York, N. Y.

Marcus Simpson, A.M., 1892.
Instructor in German, Cornell University, Ithaca, N. Y.

Jessie Frances Smith, A.M., 1897.
Teacher in the Girls' High School, New York, N. Y.

Edward Lee Thorndike, Ph.D., 1898.
Instructor in Psychology and Education, Western Reserve University, Cleveland, Ohio.

Harlan Updegraff, A.M., 1898.
Superintendent of Schools, Knoxville, Iowa.

Helen Isabel Whiton, Ph.D., 1898.
Assistant in Literature, Smith College, Northampton, Mass.

Norman Wilde, Ph.D., 1894.
Instructor in Philosophy, University of Minnesota.

The removal to the new site and the adjustment of the work of the Faculty to the new surroundings were accomplished speedily and without friction or difficulty. By common consent, the year just closed has been the most successful in our history.

Respectfully submitted,
NICHOLAS MURRAY BUTLER,
Dean.

June 30, 1898.

Statement A

COURSES OF INSTRUCTION, 1897–98

Instructor	Courses	Hours per Week	Students	Auditors	Total Number Attending
	PHILOSOPHY, PSYCHOLOGY, AND EDUCATION				
	I.—Philosophy				
Prof. Butler and Dr. Wilde	I. Historical Introduction to Philosophy	3	62	7	69
Prof. Hyslop	II. Ethics, introductory course	2	5	1	6
Prof. Butler	III. Philosophy of Kant and his successors	2	35	1	36
Prof. Hyslop	V. Practical Ethics	2	23		23
Dr. Wilde	VII. History of English Ethics 1st half-year	2	12		12
Dr. Wilde	VIII. History and Principles of Æsthetics	2	20		20
Prof. Hyslop	IX. Applied Logic and Scientific Method	3	5		5
Prof. Butler	Seminar in Philosophy	2	12		12
Prof. Hyslop	Seminar in Ethics	1	11		11
	II.—Psychology				
Instructors of the Division	I. Introduction to Psychology	2	20	5	25
Prof. Cattell	II. Experimental Psychology	2	6		6
Prof. Cattell	III. Experimental Psychology, laboratory work	2	3		3
Prof. Cattell	IV. Mental Measurement	2	8	1	9
Prof. Cattell	V. Research work in Experimental Psychology	Daily	6		6
Mr. Strong	VI. General Psychology, advanced course	2	10	1	11
Dr. Farrand	VIII. Physiological Psychology	3	2		2
	III.—Anthropology				
Dr. Farrand	I. Anthropology, introductory course	2	10		10
Dr. Farrand	II. Primitive Culture	2	10		10
	IV.—Education				
Prof. Butler	I. History of Education	1	30	3	33
Prof. Butler	II. Principles of Education	2	33	2	35
Prof. Butler	Seminar in Education	2	13		13

	LITERATURE				
Prof. Woodberry	II. Theory, History, and Practice of Criticism	3	24		24
Prof. Brander Matthews	III. Epochs of the Drama	2	22		22
Prof. Brander Matthews	V. Molière and English Comedy	1	6		6
Prof. Woodberry and Mr. Taylor	VII. Critical Studies in Literature	3	21	2	23
Prof. Woodberry and Mr. Taylor	VIII. Historical Studies in Literature	3	7		7
	RHETORIC				
Prof. G. R. Carpenter	I. English Composition, 1st half-year	3	5		5
Prof. G. R. Carpenter	II. English Composition, 2d half-year	3	4		4
Prof. G. R. Carpenter	III. English Composition, advanced course	2	12		12
Mr. Ringwalt	IV. Elocution	2	1		1
Prof. Brander Matthews	V. Art of English Versification	1	4		4
	ENGLISH				
Prof. Price	III. Anglo-Saxon Literature	2	3		3
Prof. Price	IV. Chaucer	2	10		10
Prof. Price	VI. English Language and Literature of the 14th and 15th Centuries	2	8		8
Prof. Price	X. English Verse Forms	2	10		10
Profs. Woodberry and Jackson	XIII. English Literature from the birth of Shakspere to 1660	3	10		10
Prof. Brander Matthews	XVI. American Literature	2	40		40
Prof. Price	XVII. The Poetry of Tennyson, Browning, and Arnold	2	36	17	53
	ORIENTAL LANGUAGES				
	I.—Semitic				
Prof. Gottheil	I. Biblical Hebrew, elementary course	2	7		7
Prof. Gottheil	II. Biblical Hebrew, second course	2	11	2	13
Prof. Gottheil	IV–V. Rabbinical Hebrew	2	7		7
Prof. Gottheil	VIII. Semitic Epigraphy	1	4	1	5
Prof. Gottheil	X. Assyrian, elementary course	2	4		4
Prof. Gottheil	XII–XIII. Arabic	2	7		7
Prof. Gottheil	XIV. Arabic, advanced course	2	6	1	7
Prof. Gottheil	XV. Syriac, elementary course	2	2	1	3
Prof. Gottheil	XVI. Syriac, second course	2	3		3
Prof. Gottheil	XVII. Ethiopic	1	5	1	6
Prof. Gottheil	Semitic Seminar	1	10	1	11

Instructor	Courses	Hours per Week	Students	Auditors	Total Number Attending
	II.—Sanskrit				
Prof. Jackson	I. Sanskrit, elementary course	3	5		5
Prof. Jackson	III. Sanskrit, advanced course	2	4		4
Prof. Jackson	VIII. Lectures on Sanskrit Literature	1	4		4
	III.—Iranian				
Prof. Jackson	II. Avestan, elementary course	2	1		1
Prof. Jackson	IV. Avestan, advanced course	2	2		2
Prof. Jackson	VI. Old Persian, Cuniform Inscriptions	1	1		1
Prof. Jackson	VII. Pahlavi, introductory course, 2d half-year	1	1		1
Mr. Yohannan	XI. Modern Persian, introductory course	2	3		3
Mr. Yohannan	XII. Modern Persian, advanced course	1	3		3
	GREEK				
Prof. Wheeler	V. Lectures on Greek Literature	3	6		6
Prof. Perry	VII. The Republic and Phædrus of Plato	3	16		16
Prof. Wheeler	IX. Aristotle's Poetics	2	6		6
Dr. Young	X. New Testament Greek: Gospels and Acts, 1st half-year	2	3		3
Dr. Young	XI. New Testament Greek: Epistles, 2d half-year	2	3		3
Dr. Young	XII. Introduction to the Study of Greek Archæology	2	5		5
Prof. Wheeler	XV. Greek Epigraphy	2	7		7
Prof. Perry	Greek Seminar, 2d half-year	2	4		4
	LATIN				
Prof. Egbert and Dr. McCrea	III. Roman Philosophy: Cicero and Lucretius	3	6		6
Prof. Egbert	V. Study of Latin Inscriptions	2	3	1	4
Prof. Peck	VI. Rapid Reading of Horace, Ovid, and Virgil	2	13		13
Prof. Peck	VII. Petronius	2	8		8
Prof. Peck	VIII. History of the Latin Language	2	10		10
Prof. Egbert	IX. Latin Inscriptions, advanced course	2	8		8
Prof. Egbert	X. Latin Palæography and Diplomatics	1	1		1
Dr. McCrea	XI. Advanced Prose Composition	2	2		2

		GERMANIC LANGUAGES				
Dr. Babbitt	III.	Historical Prose	3	2		2
Prof. Thomas	V.	History of German Literature	2	6		6
Prof. Thomas	VI.	Goethe's Faust	2	5		5
Prof. Thomas	VII	Practice in speaking and in writing German	2	1		1
Prof. W. H. Carpenter	VIII.	History of the German Language	2	2		2
Prof. Thomas	IX.	Great Writers: Lessing and Goethe	2	5		5
Prof. Thomas	X.	Swedish	2	4		4
Prof. W. H. Carpenter	XI.	Icelandic, elementary course	2	5		5
Prof. W. H. Carpenter	XII.	Gothic	2	7		7
Prof. W. H. Carpenter	XIII.	Introduction to Germanic Philology	2	2		2
Profs. W. H. Carpenter and Thomas		Germanic Seminar	2	6	1	7
		ROMANCE LANGUAGES				
		I.—Romance Philology				
Prof. Todd	I.	Introduction to Romance Philology	2	5		5
Prof. Todd	III.	Old French Dialects	1	3		3
Prof. Todd		Seminar in Romance Philology	2	3		3
		II.—Provençal				
Prof. Todd	I.	Old Provençal	1	3		3
		III.—French				
Dr. Page	VII.	History of French Poetry in the first half of the 19th Century	1	3		3
Dr. Page	VIII.	History of French Poetry in the second half of the 19th Century	1	6		6
Prof. Cohn	XI.	History of Literary Criticism in France	1	4	2	6
Prof. Cohn		Seminar in Romance Literature	2	11	1	12
		IV.—Italian				
Prof. Speranza	I.	Italian, elementary course	3	1		1
Prof. Speranza	III.	Italian Literature in the 14th and 15th Centuries	3	6		6
Prof. Speranza	IV.	Critical Study of Dante's Divina Commedia	2	3	5	8
		V.—Spanish				
Prof. Todd	IV.	Origins of Spanish Poetry	1	1		1
		MUSIC				
Prof. MacDowell	I.	General Musical Culture	2	8		8
Prof. MacDowell	II.	Development of Modern Music	2	5		5
Prof. MacDowell	III.	Harmony	2	18		18
Prof. MacDowell	IV.	Counterpoint and Fugue	2	11		11

Statement B

UNIVERSITY FELLOWS, 1897–98

1. Victor Seldon Clark . . . Latin.

   University of Minnesota, B.L., 1890.

   Subjects of investigation: The Satiræ of Petronius and Private Life of the Romans; Roman Archæology and Epigraphy; Development of the Law of Theft in the Digest, Salic Law, Lombard Codes, Sachsenspiegel, and Modern Codes; The Latinity of the Middle Ages and the Renaissance.

   Topics for papers or lectures: Studies in the Latin of the Middle Ages and the Renaissance; The Roman Slave as an Independent Agent in Business Transactions; Tesseræ Gladiatoriæ; The Cippi Terminales of the Roman Pomerium; The Inscription of Duilius; Decrees of Roman Magistrates preserved in Inscriptions; The Inscriptions of the Arval College; Tabulæ Lusoriæ; The Origin and the Epigraphic Use of the Word *Af.*

2. John Driscoll Fitz-Gerald, II . . Romance Languages

   Columbia College, A.B., 1895.

   Subjects of investigation: French Drama from its Origins to the Death of Racine; Research supplementary to Körting's Lateinisch-romanisches Wörterbuch; Old French Dialects; The Origins of Spanish Poetry: (El Poema del Cid); Italian Literature of the XIV and XV Centuries; Old Provençal; Popular Latin.

   Topics for Papers or Lectures: Les Sources des Tragédies de Garnier, et la Manière dont il s'en est servi; Les Sources du "Cid" et de "Tite et Bérénice," et la Manière dont Corneille s'en est servi; Les Sources du "Menteur" et de "La Suite du Menteur," et la Manière dont Corneille s'en est servi; Les Sources de "L'Avare," et la Manière dont Molière s'en est servi; Etymologies supplementary to Körting's Lateinisch-romanisches Wörterbuch; The Neglect of the Subjunctive in the "Andria" of Terence.

3. George Tobias Flom . . . German.
   University of Wisconsin, B.L., 1893.
   Vanderbilt University, A.M., 1894.
   Subjects of investigation: Historical Development of "With" from "Widsith" to the Time of the Disappearance of "mid" in English; "In" for "hw" (wh) in Certain Works in Middle English and in Scotch.
   Topics for papers or lectures: The Dialect of the O. G. Hildebrandslied; Germanic Incantations; Origin of the German Rhyme-verse; Development of the High German Literary Language, with Especial Reference to Luther's Influence; Lochmann's Ballad Theory and the Nibelungenlied; The Thidreksaga: its Origin and Development;
   Publications with Professor W. H. Carpenter: Review of Norwegian Grammar and Reader (G. E. Olson, 1898); Modern Language Notes, May, 1898.

4. Louis Herbert Gray . . . Indo-Iranian Languages.
   Princeton University, A.B., 1896.
   Subjects of investigation: Various topics in Sanskrit, classical and Vedic; in the Avesta; in Ancient Persian; in Pahlavi; in New Persian; and in Arabic.
   Topics for papers or lectures: The Metres of Bhartrihari, a Study in Sanskrit Versification; Study of the Ancient Persian Inscriptions, First Part, and in preparation: Apâm Napât in the Avesta and in the Atharva Veda.

5. Adam Leroy Jones . . . Philosophy.
   Williams College, A.B., 1895.
   Subjects of investigation: The Psychology of Association from Plato to Herbert Spencer; Individualism in Greek Education.

Topics for papers or lectures: Kant's Doctrine of Motives; Kant's Doctrine of Freedom; Steps in the Acquisition of Knowledge, according to Kant; Greek Charities and Charitable Organizations; Comparison of the Theatre and Drama of the Greeks with those of the Elizabethans.

6. Alexander von Wolffersdorff Leslie . . . Literature.

Harvard University, A.B., 1894.
Lincoln University, A.M., 1895.

Subjects of investigation: Spenser's Indebtedness, in his "Shepheardes Calendar" to the "Eclogues of Mantuan"; the Sources of Spenser's "Visions of Bellay"; the Sources of the Plays of Plautus and of Terence; the Assignment of the Parts to the Actors in the Tragedies of Æschylus.

Topics for papers or lectures: the Commentator on Spenser's "Shepheardes Calender"; the Relations of the Greek Hymns to the Jewish and Latin Hymns; the Sicilian School of Italian Litterature; the Minnesingers; a Sketch of Othello, remodelled on the lines of Euripides; a Sketch of Sophocles' "Œdipus the King," remodelled on the lines of Shakspere; the First Performance of a Tragedy of Sophocles, as it would have appeared to a Modern Spectator.

7. Leonard Beecher McWhood . . . Psychology.

Columbia College, A.B., 1893.

Subjects of investigation: Automatic and Voluntary Movements and their Relation to Pleasure and Pain, with Special Reference to Feelings derived from Music; the Influence of Music on the Capability to do Work.

Topics for papers or lectures: Three papers on the subjects of Research, and kindred subjects; some new apparatus exhibited at the Annual Exhibition of the New York Academy of Sciences; and a paper read before the New York Academy of Sciences on the subject of Research.

8. William Thomas Ferguson Tamblyn . . . Classical Philology.
   (Henry Drisler Fellow)
   Toronto University, A.B., 1895.
   Subjects of investigation: Tesseræ Theatrales and Hospitals; Elogia; The Intervocalic 'h' in Latin; The "Duenos" Inscription; Roman Aqueducts; Roman Army Organization; The Fasti Consulares; Certain Points in Aristotle's Poetics; the so-called Realism of Euripides; Establishment of Roman Power in Britain.
   Topics for papers or lectures: Elogia; Intervocalic 'h' in Latin; The Fasti Consulares; Roman Mining; Roman Quarries and Quarry Inscriptions; Devotiones; Quantitative Differentiation in Latin; Petronian Vulgarisms; The Indian Frontier War (published in part in the *Mail and Express*, January 8, and January 22, 1898).
9. Edward Lee Thorndike . . . Psychology
   Wesleyan University, A.B., 1895.
   Harvard University, A.B., 1896, and A.M., 1897.
   Subjects of investigation: An Experimental Study of the Associative Processes in Animals; Descartes' Psychology.
   Topics for papers or lectures: Animal Intelligence; an Experimental Study of the Association Process in Animals—*Psychological Review*, 1898; Some Experiments in Animal Psychology, read before the Anthropological Section of the Academy of Sciences; The Formation of Associations by Animals; Imitation and Reasoning; The Mental Fact in Association; Some Theoretical Questions of Comparative Psychology; Descartes' Theory of the Brain.

Statement C

RECOMMENDATIONS FOR DEGREES, 1897–98

I.—Doctor of Philosophy:

1. Lawrence Thomas Cole,
   University of Michigan, A.B., 1892, and A.M., 1896.
   General Theological Seminary, B.D., 1896.
   Major subject: Philosophy.
   Minor subjects: Ethics; Political Philosophy (under Faculty of Political Science).
   Dissertation: The Basis of Early Christian Theism.
2. Lucia Catherine Graeme Grieve,
   Wellesley College, A.B., 1883, and A.M., 1893.
   Major subject: Greek Archæology and Epigraphy.
   Minor subjects: Greek Language and Literature; Hebrew.
   Dissertation: Views of Death and Burial Customs of the Athenians as evidenced by the Tragedies of the V Century. Part 1: Death and the Dead.
3. Abel Joel Grout,
   University of Vermont, Ph.B., 1890.
   Major subject: Botany (under Faculty of Pure Science).
   Minor subjects: Zoölogy (under Faculty of Pure Science); Education.
   Dissertation: A Revision of the North American Isotheciaceæ and Brachythecia.
4. Adam Leroy Jones,
   Williams College, A.B., 1895.
   Major subject: Philosophy.
   Minor subjects: Education; Literature.
   Dissertation: Early American Philosophers.
5. Wilfrid Lay,
   Columbia College, A.B., 1892.
   Major subject: Psychology.
   Minor subjects: Philosophy; Latin.
   Dissertation: Mental Imagery.

6. John Angus MacVannel,
   University of Toronto, A.B., 1893, and A.M., 1894.
   Major subject: Philosophy.
   Minor subjects: Anthropology; Sociology (under Faculty of Political Science).
   Dissertation: Hegel's Doctrine of the Will.

7. Hugo Radau,
   Columbia University, A.M., 1897.
   Major subject: Semitic Languages.
   Minor subjects: Semitic Languages; Iranian.
   Dissertation: The E. A. Hoffman Collection of Babylonian Clay Tablets in the General Theological Seminary.

8. Edward Lee Thorndike,
   Wesleyan University, A.B., 1895.
   Harvard University, A.B., 1896, and A.M., 1897.
   Major subject: Psychology.
   Minor subjects: Philosophy; Zoölogy (under Faculty of Pure Science).
   Dissertation: Association in Animals.

9. William Morrow Washington,
   Centre College, B.S., 1895.
   Major subject: Philosophy.
   Minor subjects: Psychology; Education.
   Dissertation: The Material and Formal Elements of Kant's Ethics.

10. Helen Isabel Whiton,
    Smith College, A.B., 1894.
    Columbia University, A.M., 1897.
    Major subject: English Language and Literature.
    Minor subjects: Germanic Philology; Romance Philology.
    Dissertation: The Coördinate and Subordinate Conjunctions in Chaucer's "Troilus and Criseyde" with a comparison of "The Romaunt of the Rose."

II.—Master of Arts:

1. Ernest Kempton Adams,
   Yale University, Ph.B., 1896.
   Columbia University, E.E., 1897.
   Major subject: Electrical Engineering (under Faculty of Applied Science).
   Minor subjects: Mechanical Engineering (under Faculty of Applied Science); Psychology.
   Essay: Electrical Devices.

2. Elijah William Bagster-Collins,
   Brown University, A.B., 1897.
   Major subject: Germanic Languages and Literatures.
   Minor subjects: Germanic Languages and Literatures; Indo-Iranian.
   Essay: The Source of William Morris's Poem, "The Lovers of Fudrun."

3. Frederic Huntington Bartlett,
   Harvard University, A.B., 1895.
   Major subject: Literature.
   Minor subjects: Literature; Education.
   Essay: Literature in Secondary Schools.

4. Frances Spaulding Belcher,
   Vassar College, A.B., 1893. Radcliffe College, A.B., 1895.
   Major subject: American History (under Faculty of Political Science).
   Minor subjects: European History (under Faculty of Political Science); Latin.
   Essay: The Administration of Governor Andros in New York and in Massachusetts.

5. Lewis Nathaniel Chase,
   Columbia College, A.B., 1895.
   Major subject: Literature.
   Minor subjects: Literature; Anglo-Saxon.
   Essay: Shakspere's Sonnets.

6. Treadwell Cleveland, Jr.,
   Williams College, A.B., 1897.
   Major subject: Philosophy.
   Minor subjects: Anthropology; Ethics.
   Essay: Greek Psychology before Aristotle.
7. Emily Matilda Coddington,
   London University, A.B., 1896.
   Major subject: Mathematics (under Faculty of Pure Science).
   Minor subjects: Mechanics (under Faculty of Pure Science); Greek.
   Essay: Historical Development of Determinants.
8. Alexander Griswold Cummins, Jr.,
   Swarthmore College, A.B., 1889.
   Major subject: Literature.
   Minor subjects: Sociology (under Faculty of Political Science); Philosophy.
   Essay: Realism: a Development in Fiction.
9. Elizabeth Brown Cutting,
   Vassar College, A.B., 1893.
   Major subject: American History (under Faculty of Political Science).
   Minor subjects: European History (under Faculty of Political Science); Greek.
   Essay: Had the Massachusetts Town an Archetype?
10. Isabel Eaton,
    Smith College, B.L., 1888.
    Major subject: Sociology (under Faculty of Political Science).
    Minor subjects: Economics (under Faculty of Political Science); Education.
    Essay: Colored Domestic Service among the Negroes of Philadelphia.
11. Dora Bay Emerson,
    Wellesley College, B.S., 1892.
    Major subject: Literature.
    Minor subjects: Literature; Italian.
    Essay: Petrarca and Laura.

12. Wilson Warren Fowler,
    Rutgers College, B.S., 1897.
    Major subject: Education.
    Minor subjects: Psychology; Philosophy.
    Essay: School Boards: their History, Constitution, and Powers.

13. William Henry Fry,
    Columbia College, A.B., 1897.
    Major subject; American History (under Faculty of Political Science).
    Minor subjects: European History (under Faculty of Political Science); Latin.
    Essay: Overthrow of the Massachusetts Charter, 1684.

14. Appleton Grannis,
    Columbia College, A.B., 1893.
    Major subject: Ethics.
    Minor subjects: Philosophy; Sociology (under Faculty of Political Science).
    Essay: Kant's Treatment of the Problem of the Freedom of the Will.

15. Henry David Gray,
    Colgate University, Ph.B., 1897.
    Major subject: Literature.
    Minor subjects: Literature; Philosophy.
    Essay: The Treatment of the Villain in Shakspere and Molière: Typified in Iago and Tartuffe.

16. Louis Herbert Gray,
    Princeton College, A.B., 1896.
    Major subject: Indo-Iranian Languages and Literatures.
    Minor subjects: Indo-Iranian Languages and Literatures; Arabic.
    Essay: The Metres of Bhartrihari: a study in Sanskrit Versification.

17. Ellen Gunton,
    Swarthmore College, A.B., 1896.

Major subject: Education.
Minor subjects: Literature; English.
Essay: The History of the Development of the Office and Powers of State Superintendent in the United States.

18. Lucy Heald,
Smith College, A.B., 1895.
Major subject: Education.
Minor subjects: Rhetoric; English.
Essay: The City Superintendent of Schools.

19. Hugh Henry Herdman, Jr.,
Wabash College, A.B., 1896.
Major subject: Literature.
Minor subjects: English; Literature.
Essay: The Individualization of the Characters of the Women in Greek Literature from Homer to Euripides.

20. Edward Kasner,
College of the City of New York, B.S., 1896.
Major subject: Mathematics (under Faculty of Pure Science).
Minor subjects: Mechanics (under Faculty of Pure Science); Philosophy.
Essay: A Generalization: Derivatives of any Order.

21. Florence Corliss Lamont,
Smith College, B.S., 1893.
Major subject: Philosophy.
Minor subjects: Literature; English.
Essay: A Criticism of Browning's Dramas from the Aristotelian Point of View: a study in the Philosophy of Literature.

22. John Henry Lyon,
Columbia College, A.B., 1897.
Major subject: English Language and Literature.
Minor subjects: Literature; Indo-Iranian.
Essay: The Rime in the Poems of Cynewulf.

23. Henry Clay McComas, Jr.,
    Johns Hopkins University, A. B., 1897.
    Major subject: Sociology (under the Faculty of Political Science).
    Minor subjects: Church History (under Faculty of Political Science); Hebrew.
    Essay: Comparison and History of Private Charities.
24. Lucia Morrill,
    Wellesley College, A.B., 1890.
    Major subject: Greek.
    Minor subjects: Philosophy; Latin.
    Essay: A Study of Apollo in Pindar.
25. Charles Aaron Rubinstein,
    University of Cincinnati, B.L., 1891.
    Major subject: Philosophy.
    Minor subjects: Ethics; Arabic.
    Essay: Animus and Anima in Roman and in Scholastic Philosophy.
26. Adelaide Rudolph,
    Hiram College, A.B., 1879.
    Major subject: English.
    Minor subjects: Latin; Sanskrit.
    Essay: Story Books when Chaucer was a Boy.
27. George Reese Satterlee,
    Columbia College, A.B., 1894.
    Major subject: The course in the College of Physicians and Surgeons with distinction.
    Minor subject: Anthropology.
    Essay: Apraxia and its Relation to Aphasia.
28. John Philip Schneider,
    Wittenberg College, A.B., 1896.
    Major subject: English Language and Literature.
    Minor subjects: English Literature; Germanic Literature.
    Essay: The Verse Forms of Chaucer's "Romaunt of the Rose."
29. Stephen Faunce Sears,
    Harvard University, A.B., 1896.
    Major subject: Literature.

Minor subjects: Literature; English.
Essay: The Sources of Spenser's Amoretti.

30. Gerald Birney Smith,
Brown University, A.B., 1891.
Major subject: Philosophy.
Minor subjects: Church History (under Faculty of Political Science); Greek.
Essay: The Platonism of early Christian Theology.

31. Ettie Stettheimer,
Columbia University, A.B., 1896.
Major subject: Philosophy.
Minor subjects: Psychology; Literature.
Essay: Subjective and Objective Morality in Psychological Hedonism.

32. Rudolf Tombo, Jr.,
College of the City of New York, B.S., 1895.
Major subject: Germanic Languages and Literatures.
Minor subjects: Germanic Languages and Literatures; English.
Essay: Commentary upon the "Gochhausen" Faust.

33. Harlan Updegraff,
Cornell College, Ph.B., 1894.
Major subject: Education.
Minor subjects: American History (under Faculty of Political Science); Political Economy (under Faculty of Political Science).
Essay: The History of the School District as a Unit of Educational Organization in the United States.

34. Edgar Swan Wiers,
Adelbert College, A.B., 1895.
Major subject: Philosophy.
Minor subjects: Socialism (under Faculty of Political Science); Church History (under Faculty of Political Science).
Essay: The Primary Elements of the Material of Knowledge.

SCHOOL OF PURE SCIENCE

REPORT OF THE DEAN

FOR THE ACADEMIC YEAR ENDING JUNE 30, 1898.

To the President of Columbia University
in the City of New York:

SIR:

I have the honor to submit the sixth annual report on the work of the Faculty of Pure Science. This report refers to the academic year ending June 30, 1898, and consists, first, of the report of the Dean, and secondly, of the reports of the heads of the departments represented in the Faculty.

The statistics of attendance in the School of Pure Science for the past year are embodied in the following detailed statement. Appended to this statement is a table giving a summary of the statistics of the School since its organization. The total number of students pursuing work either wholly or in part under the direction of the School during the year was 184, an increase of 35, or about 23 per cent. over the corresponding number of the preceding year.

Number of students registered primarily under the Faculty of Pure Science:

Candidates for the higher degrees	41
Special students (not candidates for degrees)	25
	66

Number of students registered primarily under other Faculties of the University:

Candidates for the higher degrees:	
From Schools of Applied Science	10
" School of Philosophy	2
" School of Political Science	1
" School of Medicine	21
" Barnard College	12
	46

Number of students registered primarily under other Faculties of the University:

Special students (not candidates for the higher degrees but pursuing graduate work):

From Schools of Applied Science	17
" School of Political Science	1
" School of Medicine	17
" School of Law	1
" Columbia College	1
" Barnard College	12
	49

Number of Seniors pursuing elective subjects under the Faculty of Pure Science:

From Columbia College	9
" Barnard College	14
	23

Total number of students under instruction in the School of Pure Science........................ 184

Table showing statistics of attendance in School of Pure Science since its organization:

	1892–3	1893–4	1894–5	1895–6	1896–7	1897–8
Graduate students registered in School of Pure Science	13	25	26	28	36	41
Graduate students registered in other Schools	3	4	5	8	18	46
Undergraduates from Columbia College	37	29	14	24	24	9
Undergraduates from Barnard College	....	....	....	....	9	14
Students from School of Medicine	....	....	3	8	22	17
Students from Schools of Applied Science	....	....	9	10	9	17
Special students (graduates and undergraduates)	6	9	9	7	31	40
Totals	59	67	66	85	149	184

The figures in the above table and those of the preceding statement show the principal sources of increase in the number of students in the School during the past year as compared with the preceding year. The increase is most marked in the number of graduate students registered primarily in the School, in the number of graduate students registered primarily in other Schools of the University, and in the number of special students.

Of the 66 students registered primarily in the School of Pure Science, 18 hold the degree of A.B., 21 the degree of B.S., 5 the degree of Ph.B., 2 the degree of C.E., 1 the degree of M.E., 1 the degree of Mech.E., and 1 the degree of Ph.C.; 12 hold the degree of A.M., 4 the degree of M.S., 5 the degree of M.D., 1 the degree of Ph.D., and 18 hold no degree.

Of the graduate students from other Schools of the University, 33 hold the degree of A.B., 7 the degree of B.S., 4 the degree of Ph.B., 3 the degree of E.E., 1 the degree of C.E., 1 the degree of A.M., and 1 the degree of M.S.

Of the 93 students included in these two classes holding first degrees, 21 come from Columbia University, while the remaining 72 come from forty-three different institutions of twenty-three different States and foreign countries.

Of the whole number of students in the School, all but 30, or 16 per cent. of them, either held primary degrees or received them at the commencement of the year.

The following table gives the names and the titles of the dissertations of the candidates upon whom the degree of Doctor of Philosophy was conferred on the recommendation of the Faculty of Pure Science.

Candidate	Title of Dissertation
Gary Nathan Calkins, B.S., Massachusetts Institute of Technology, 1890.	Mitosis in Noctiluca Miliaris and its bearing on the nuclear relations of the protozoa and metazoa.
Wilbur Dwight Engle, A.B., Albion College, 1893; A.M., 1894.	Some Thiocyanates.
Abel Joel Grout, Ph.B., University of Vermont, 1890.	A Revision of the North American Isotheciaceæ and Brachythecicæ.
Marshall Avery Howe, Ph.B., University of Vermont, 1890.	The Hepaticæ of California.
Albert Prescott Mathews, B.S., Massachusetts Institute of Technology, 1892.	The structural changes in the pancreas cell, with some general considerations on cell metabolism.

Candidate	Title of Dissertation
John Alexander Mathews, B.S., Washington and Jefferson College, 1893; M.S., 1896; A.M., Columbia University, 1895.	On the action of fatty nitrils upon aromatic acids.
Per Axel Rydberg, Graduate, Royal Gymnasium, Skala, Sweden, 1881; B.S., University of Nebraska, 1891; A.M., 1895.	A Revision of the North American Potentilleæ.
Frank Schlesinger, B.S., College of the City of New York, 1890; A.M., Columbia University, 1897.	The Præsepe Group: measurement and reduction of the Rutherfurd Photographs.

Similarly, the following table presents the names and the titles of the essays of candidates recommended for and receiving the degree of Master of Arts:

Candidate	Title of Essay
Anson Gardner Betts, Ph.B., Yale University, 1897.	On ethers of nitro-amido and oxybenzyl alcohols.
Emily Matilda Coddington, A.B., London University, 1896.	History of Determinants.
Franklin Abbott Dorman, A.B., Harvard University, 1894.	The function of the semi-circular canals.
Eugene Harold Eising, B.S., College of the City of New York, 1894.	Chemotaxis.
Elmer Wallace Firth, C.E., Cornell University, 1895.	Mechanical Filtration.
Charles Francis Fitzgerald, A.B., Holy Cross College, 1894.	The relations of the fissures of the brain to the surface in the adult.
James Lambert Gibson, B.S., University of Utah, 1895.	An historical survey of the fundamental principles of statics.
George Arthur Goodell, A.B., Amherst College, 1894.	A comparison of methods for the determination of lead and zinc ores.
August Henry Gotthelf, B.S., Columbia University, 1897.	Succinimid and related bodies.
Nathan Williams Green, A.B., Yale University, 1894.	The influence of food upon the differentiation of sex in tadpoles.
Leo Walter Hildburg, E.E., Columbia University, 1897.	An electrolytic refinery at the Arcu Mine.
Benjamin Felix Hill, B.S., University of Texas, 1896; M.S., 1897.	Notes on a set of crystalline rocks from Wyoming.
John Duer Irving, A.B., Columbia University, 1896.	On some contact phenomena of the Palisades diabase.
Edward Kasner, B.S., College of the City of New York, 1896.	On general differentiation.

Candidate	Title of Essay
Herman Andreas Loos, B.S., College of the City of New York, 1895.	The electrolytic determination of zinc as amalgam.
James Bruce McClelland, B.S., Columbia University, 1897.	Treatise on foundations of high buildings.
Leo Bernard Meyer, A.B., College of the City of New York, 1894.	The arrangement and development of the frontal fissural complex.
Joseph Henry O'Connell, A.B., Holy Cross College, 1894.	The development of the paroccipital complex.
John Hill Prentice, A.B., Columbia University, 1897.	The new shaft kranklinite deposits at Franklin, N. J. Methods of mining and treating ores.
Henry Clay Ruhl, A.B., College of the City of New York, 1893.	The genito-urinary system in rodents.
Emilius William Scherr, Jr., A.B., College of the City of New York, 1896.	The electrolytic estimation of zinc.
George Albert Soper, B.S., Rensselaer Polytechnic Institute, 1895.	Chemical and microbic action in filter beds.
Israel Strauss, A.B., Brown University, 1894.	Relation of fissures in the brain of the child to the cranium.
Percy Rivington Turnure, A.B., Harvard University, 1894.	A brief investigation of the muscular contraction in the common turtle.
Christopher VanDeventer, E.E., Columbia University, 1897.	The efficiency of the incandescent lamp.
Leon Laizer Watters, B.S., University of Utah, 1897.	A brief review of the synthetic organic compounds used in perfumery.
Edward Williams White, B.S., Georgetown College, Ky., 1884.	Taylor's series.

The number of separate courses of instruction offered by the departments of the School has been somewhat increased during the year, the total number of courses offered for the year 1898–9 being 174. Several new courses have been added and others have undergone more or less of change or readjustment. The distribution of courses in the departments, as shown by the Announcement for 1898–9, and the number of courses given by each department during the past year, are shown in the following table. It should be observed, however, that this table does not give a complete idea of the work of the several departments. For the details of such work reference must be made to the accompanying departmental reports. The table is intended rather to give a general idea of the opportunities afforded by the School and to show the actual number of courses given during the past year.

Department	Number of Courses Offered		Number of Courses Given during 1897–8
	Graduate	Collegiate	
Mathematics,	11	7	14
Mechanics,	16	2	12
Physics,	30	1	20
Chemistry,	17	9	..
Mineralogy,	8	3	9
Astronomy,	4	3	4
Geology,	8	2	6
Zoölogy,	12	3	10
Botany,	7	8	10
Physiology,	5	..	5
Anatomy,	16	4	16
Bacteriology,	2	..	1
Totals,	136	42	107

In addition to the courses included in the above table, three courses in anthropology were given by Dr. Franz Boas, Lecturer in Anthropology.

The number of courses in the School open to auditors and to women has been increased during the year from thirty-seven to fifty-six. The distribution of these courses as to subjects is as follows:

In Mathematics	11
In Mechanics	11
In Physics	2
In Mineralogy	4
In Astronomy	5
In Geology	4
In Zoölogy	9
In Botany	7
In Anthropology	3
Total	56

By far the most important event of the year to the School of Pure Science was the transfer from the old to the new site of the University. The accomplishment of this work during the summer and early autumn of 1897 called for arduous efforts from the teaching staff, especially in those departments having museum collections and laboratory apparatus. That the transfer was successfully carried out with little friction and little delay, even before the builders had completed their labors, is alike surprising and gratifying. Nearly every department was ready to take up its work at the beginning of the academic year, and the general programme was adhered to quite as closely as during any preceding year of the School's history.

The noble buildings of the new site, the enlarged equipment of many departments, and the ampler facilities of all departments quartered in the new buildings, are sources of profound gratification to the Faculty and the teaching staff of the School. These buildings and their accessories are in themselves monuments to the progress of science; while the devotion of so many of them to the departments of our School is a most stimulating recognition of the merits of scientific achievement.

With such inspiring surroundings the officers and students of the School could not fail to labor with renewed vigor, and, as shown by the statistics already given, the work of the year proved more prosperous than that of any previous year.

Attention is respectfully invited to the departmental reports for details concerning the varied activities of the members of the School. These details refer to the work of instruction, to original investigations, to field explorations, to accessions to departmental equipments, etc. Most important of these are the original investigations, the contributions to the proceedings of scientific societies, and the publications of the staff; for they afford a measure of the scientific zeal and productivity on which the School must ultimately depend for its justification. It is worthy of note also in this connection that the scientific zeal of the teaching staff is reflected in the high grade of work done during the year by graduate students, especially by University Fellows and Scholars in the School.

On behalf of the Faculty the Dean notes with admiration the enlightened liberality of Miss Catherine W. Bruce, through whose gift the University is enabled to secure the services of our distinguished fellow-countryman Dr. George William Hill, as Lecturer on Celestial Mechanics.

Referring to departmental reports for details of acknowledgment, the Dean also begs to express the warmest appreciation by the Faculty of the financial gifts of Rutherfurd Stuyvesant, Esq., and Miss Catherine W. Bruce in aid of the work of the Department of Astronomy; of Charles H. Senff, Esq., in aid of a zoölogical expedition under the direction of the Department of Zoölogy to the delta of the Nile; of the Wawepex Society for the establishment of a Scholarship in Biology; and of the gifts of Davidson H. Smith, Esq., Dr. Andrew H. Smith, and Mrs. W. P. Trowbridge, of apparatus to the Department of Physics.

The School has lost through death during the year two graduate students of brilliant promise, Mr. Joseph Germains Charles Cottier, Fellow in Mechanics, and Mr. Bradney Beverly Griffin, Fellow in Zoölogy. Mr. Cottier died of typhoid fever, at Paris, France, August 17, 1897. Mr. Griffin died of pneumonia, at New York, N. Y., March 26, 1898. Both would have completed work for the degree of Doctor of Philosophy during the year had they lived. Both were men of fine character and singularly devoted to scientific work. Sketches of their careers have been published in Nos. XIX and XX respectively of the *University Bulletin*. Acknowledgment is also made in No. XIX of the *Bulletin* of the graceful gift of the parents of Mr. Cottier of his library of scientific books and papers to the library of the Department of Mechanics. Mr. and Mrs. Cottier have thus fulfilled a pious duty to the memory of their son, and have at the same time shown his and their appreciation of the Fellowship honors which Columbia had twice bestowed upon him.

The School was honored during the year by visits of two eminent men of science, Lord Kelvin and Professor George H. Darwin. Lord Kelvin, accompanied by Lady Kelvin, visited the University on October 14, 1897. He inspected the Library and other buildings, and examined several of the laboratories, in which latter he showed great interest, and subsequently met members of the Faculty at luncheon in West Hall. Professor and Mrs. Darwin visited the University buildings in the latter part of November, 1897; and on December 10, 1897, Professor Darwin delivered in Havemeyer Hall, before the officers and students of the University, an instructive lecture on the History of the Moon and Earth.

Very respectfully submitted,
R. S. WOODWARD,
Dean.

REPORTS OF DEPARTMENTS

DEPARTMENT OF HUMAN AND COMPARATIVE ANATOMY

Professor GEORGE S. HUNTINGTON

1. Educational Staff of Department.

Dr. Geo. W. Crary was appointed Assistant Demonstrator of Anatomy at the beginning of the session, to fill the vacancy caused by the death of Dr. Douglas Ewell.

There have been no other changes in the departmental staff during the year.

2. Courses of Instruction.

(*a*) Collegiate Courses:

Courses 1 to 9 inclusive have been given in the regular curriculum of the medical course. These courses were attended by 436 students, divided as follows:

212 students of the first year in Medicine.
189 students of the second year in Medicine.
24 special students in Anatomy.
3 Seniors of Columbia College taking the first year in Medicine.
8 special students of the third and fourth year.

The practical laboratory courses in dissection have been most successfully conducted by Dr. Gallaudet and the staff of assistant demonstrators. The total number of parts issued for dissection during the academic year was 1372. Of these, 726 were supplied to the first-year class, and 646 to the second-year class. The average number of parts dissected by students of the first year was 3.6; by students of the second year, 3.2. The advantages of the additional dissecting-room space provided by the new building, and its value to the thorough and complete laboratory course in practical anatomy now offered by the Department, cannot be overestimated.

(*b*) University Courses:

The attendance upon the University courses, offered under the Faculty of Pure Science, and open as majors and minors to candidates for the higher University degrees and as optionals to qualified candidates for the medical degree, has been more than double that of any previous year. The Department regrets that, owing to the unavoidable limitations, a number of applications for these courses had to be denied.

The attendance is shown in the following table:

1. Candidates for the degree of A.M. or Ph.D.

No. of Course.	Subject of Course.	No. of Students.
13	Comparative Morphology of the Respiratory Apparatus	1
14	Comparative Neurology	5
18	Comparative Morphology of the Uro-Genital System	9
19	Cranio-Cerebral Topography	4
20	Comparative Morphology of Heart and Vascular System	1
	2. Optional courses taken by candidates for the degree of M.D. and by post-graduates.	
14	Comparative Neurology	4
	Total	24

Four members of the graduating class in Medicine fulfilled the University requirements, and were recommended for the degree of A.M.

3. Work of Fellow.

Dr. J. A. Blake, Alumni Association Fellow in Anatomy, has brought to a successful termination a most important research on the embryology and adult structure of the Fourth Ventricle, with especial reference to the metapore and the morphology of the Lateral Recess. Dr. Blake has been engaged in this work during the past two years, and his results will form one of the most valuable contributions of recent years to the anatomy of the central nervous system. Dr. Blake has also continued his researches on the topography of the thorax. His results were contained in a communication presented to the Tenth Annual Meeting of the Association of American Anatomists, held at Ithaca, N. Y., entitled, "The Relation of the Bronchi to the Thoracic Wall."

It is gratifying that Dr. Blake has been reappointed for another term by the Executive Committee of the Alumni Association.

4. Museum Work, Research, and Publications.

The work of continuing the development of the Museum of Human and Comparative Anatomy has been carried on very successfully during the year. Nearly one thousand new preparations have been added to the collection. The Museum has been utilized this year more extensively than in the past in the practical work of instruction, because several important new series have recently been sufficiently advanced to warrant their employment for demonstration purposes. The value of the equipment continues to demonstrate itself, not only for the illustration of advanced courses in morphology, but also in the regular collegiate instruction of the medical course. The series dealing with the development and comparative morphology of the pectoral girdle, genito-urinary and digestive tracts, nervous system, respiratory apparatus, heart and vascular system, have been thus utilized. Three special lectures and lantern demonstrations on the human and comparative anatomy of the female uro-genital system were given in conjunction with the Department of Obstetrics to the third-year students.

The following publications by officers of the Department appeared during the year:

G. S. Huntington—"The Eparterial Bronchial System of the Mammalia." *Annals N. Y. Acad. of Sciences*, 1898, vol. xi. Abstract in *Science*, vol. vii., No. 172.

"Comparative Anatomy and Embryology as Aids in Teaching Human Anatomy in the Medical Course." *Am. Journal of the Med. Sciences*, 1898.

"The Teaching of Anatomy." *Columbia University Bulletin*, June, 1898, No. XX.

Geo. E. Brewer—"Removal of a Sub-Cortical Cerebellar Tumor," etc. *Medical Record*, May 15th, 1898.
"A Fatal Case of Gonorrhœal Infection with Autopsy Report." *Journal of Cutaneous and Genito-Urinary Diseases*, June, 1898.
"Some Observations upon the Surgical Anatomy of the Kidney." *Medical News*, July 31st, 1897.
"Operative Surgery at the City Hospital, with a Completed Report on the Study of Wound Infection." *Medical Record*, March 13th, 1898.

J. A. Blake—"A Contribution to the Topographical Anatomy of the Mediastinum and the Superior Aperture of the Thorax." *Proceedings of the Association of American Anatomists*, Ninth Annual Session.

Churchill Carmalt—"Fractures in the New-Born." *Medical Report, Society of the Lying-In Hospital of New York*, 1897, pp. 283–308. D. Appleton & Co.

The Department participated in the meeting of the British Medical Association held in Montreal, in September, 1897, exhibiting a series of human myological and neurological variations.

The Department also took charge of the Section of Anatomy in the Fifth Annual Exhibition of the New York Academy of Sciences held in April at the American Museum of Natural History. The following series were exhibited by the Department:

1. Race brains.
2. Topography of the primary bronchi.
3. Development and comparative anatomy of the fourth ventricle.
4. Visceral anatomy of American reptiles.

Professor Huntington and Dr. Blake attended the tenth annual meeting of the Association of American Anatomists, held at Cornell University during the Christmas recess, and presented papers.

One of the most important additions of the year to the equipment of the Department is the establishment of a departmental library in direct connection with the research laboratory. During the summer the Superintendent of Buildings partitioned off the southeast corner of the main laboratory, transforming the same into a room of good size which has been equipped with bookcases, library furniture, and reading lamps. The collection of anatomical books and periodicals presented to the Department by Dr. F. H. Markoe has been considerably enlarged by purchase, exchange, and books received for review by officers of the Department. The more important anatomical periodicals will be kept on file in this room. The necessity of securing a working departmental library directly connected with the research laboratory has been accentuated by the removal of the library of the zoölogical department from the medical school to the new site. It is hoped that the Department will be able to continue developing this important portion of the equipment.

The Department records with pleasure the proposed additions, to be made during the summer, to the cold-storage plant. The improvements contemplated will result in affording the much-needed increase in storage space, and the new method of handling material will result in much more complete and satisfactory preservation.

5. *Recommendations.*

The Department desires to recommend repeatedly that the Museum floors of the Anatomical Building be furnished with proper and sufficient cases for the reception of the collections. At present the old cases, inherited from the Pathological Museum, are overcrowded, and have to be used merely for storage. It is not possible to carry out the systematic serial exhibition which is the chief purpose of the collection as applied to the requirements of instruction. The Museum in its present condition loses one of its most important educational features in not being accessible for purposes of serious study. Even for mere purposes of storage the available shelf-room has long been exhausted, and deterioration and breakage are unavoidable among the large number of valuable preparations which have to be left without case protection.

The same conditions obtain in the portions of the basement of the new building designed for the accommodation of the Reference Osteological Collection. This collection is unrivalled in the number of individual preparations, and the complete record kept of each bone makes it invaluable for purposes of statistical research. Important work of this kind was done during the winter by Dr. Hrdlicka, the anthropologist connected with the State Institute of Pathology, but the lack of proper cases makes the material very difficult of access for study and classification. It is earnestly hoped that these deficiencies in our equipment may be soon made good.

DEPARTMENT OF ASTRONOMY

Professor J. K. Rees

1. Educational Staff.

John Krom Rees, Ph.D., Professor of Astronomy and Director of the Observatory.
Harold Jacoby, Ph.D., Adjunct Professor of Astronomy.
Herman Stearns Davis, Ph.D., Tutor in Astronomy.

Charles Derleth, C.E., and W. C. Kretz, A.M., assisted in the Summer School of Practical Geodesy.

In addition to the educational staff, I have employed by the use of funds raised by myself the assistants named below:

F. E. Harpham, A.B., Chief Computer in the Observatory.
E. Magill, A.B., Computer in the Observatory.
G. Ravené, Computer on special work for six weeks.

2. *University and Other Courses.*

Instructors	Courses	Hours per Week	Students
Prof. Rees assisted by Dr. Davis	Astronomy I General Astronomy	2 and conferences at Observatory	1 Graduate 3 Seniors 1 Junior
Dr. Davis	Astronomy II Practical Astronomy	2 with Observatory work	1 A.M.
Prof. Rees Prof. Jacoby	Astronomy III Geodesy 3d year Civil Engineers	2	13 C.E.
Prof. Rees Prof. Jacoby	Astronomy III (continued) Geodesy 4th year Civil Engineers	2 1st term	22 C.E.
Prof. Jacoby and Dr. Davis with other assistants	Astronomy III Summer School in Practical Geodesy, June 1 to July 12, 1897, at Osterville, Mass.	50 for six weeks	24 C.E.
Prof. Jacoby	Astronomy VI Theory and Methods of Reductions of Photographic Star Plates	1	3 Ph.D.

3. Frank Schlesinger, B.S., A.M., has held the Fellowship in Astronomy for the year 1897–98. This June he received the degree of Ph.D. His dissertation was on "The Præsepe Group: Measurement and Reduction of the Rutherfurd Photographs." This paper is published in *Annals of the New York Academy of Sciences*, having been read before the Section of Astronomy and Physics. Mr. Schlesinger contributed a note on Refraction Formulæ to the *Astronomical Journal*, No. 430. Since graduation Dr. Schlesinger has arranged to go to the Yerkes Observatory as an assistant without salary for the summer.

W. C. Kretz, A.M., has been University Scholar during 1897–98. On July 1st he becomes University Fellow. Mr. Kretz is working on the "Measurement and Reduction of the Photographs of Coma Berenecis by Rutherfurd."

4. Researches and Publications.

Observations for Determining the Variation of Latitude at New York City and for the Constant of Aberration have been made by Professor Rees and Dr. Davis. The Royal Observatory at Naples continued its co-operation.

Professor Rees presented a paper at the Astronomical Conference held at the Yerkes Observatory in October, 1897, on "The Work of the Columbia University Observatory." The paper is printed in the *Astrophysical Journal* for December, 1897.

The results of the observations, for Variation of Latitude and for the Constant of Aberration, made between July 1, 1894, and December 31, 1897, have been computed and a preliminary report will be published shortly in the *Astronomical Journal*. The lecture on "Minor Planets," delivered by Professor Rees before the New York Academy of Sciences, has been published in the *School of Mines Quarterly* for April, 1898.

Professor Jacoby has continued his investigations on polar trail-plates, and has prepared a paper on the subject which will be published soon.

The preliminary reductions of a few trails measured on Dr. Donner's plates have shown that the method gives great promise of accurate results. The Observatory is now trying to secure $2500 to $3000 to build a special fixed telescope for making polar trail-plates. Dr. Donner of Helsingfors has agreed to mount and operate such an instrument at his Observatory. His latitude (N. 60° 9′) lessens the trouble with refraction effects.

The special direction of the computing staff has been under Professor Jacoby's care.

Three graduate students have been working under Professor Jacoby's guidance on problems connected with photographic astronomy. Miss Furness, Assistant at Vassar College Observatory, will continue next year a graduate student for the special purpose of working up the polar trail-plates by Donner.

Dr. H. S. Davis has pushed forward his reduction of

Piazzi's catalogue, and the papers mentioned in my last report have been published. He has published in May and June *Popular Astronomy* articles on "Women Astronomers."

5. The Summer Class in Practical Geodesy, which is carried on for Civil Engineers, was conducted at Osterville, Mass., from June 1st to July 12th. The class was under the charge of Professor Jacoby, assisted by Dr. Davis and Messrs. Derleth and Kretz.

6. The computations required by this Department have been made by the Computer, F. E. Harpham, A.B., and the Assistant Computer, Eudora Magill, A.B. For six weeks I secured the services of Gustav Ravené as Computer on special work.

7. Rutherfurd Stuyvesant, Esq., continued his generous giving of funds for the reduction of the Rutherfurd Photographs.

Miss Catherine W. Bruce has again been most liberal. She has contributed funds for the salaries of the Computers, and has sent President Low a gift which has made it possible for the University to appoint Dr. George W. Hill, Lecturer on Celestial Mechanics.

8. At the request of Professor Rees, Lieutenant Rodler, of the Austrian frigate *Donau*, was granted, by President Low, permission to set up the Sterneck pendulum apparatus in the basement of the Physics Building. The Physics Department furnished the room for mounting the apparatus, and the Astronomical Department supplied (from Dr. Davis's observations) the time. The *Donau* will visit various places on a cruise around the world and many determinations of "gravity" will be made. The United States Geodetic Survey Office, on learning that the Austrians had made the determinations of gravity here, applied to the Observatory to be allowed to make observations at the same place. The permission has been granted.

9. The University needs most sorely a new and properly equipped Astronomical Observatory. Many of our instruments are so old that they do not show the recent improvements. We should be able to show and to use the latest forms of the best apparatus.

DEPARTMENT OF BACTERIOLOGY

Professor T. Mitchell Prudden

One course of instruction in Bacteriology and Bacteriological Technique—University Course II—has been given by Dr. T. M. Cheesman, Instructor in Bacteriology, during the year; two of the six attendants upon this having been candidates for a higher University degree. The course has been modified and elaborated as the rapid growth of the theme demands, and the supplementary course in Photomicrography has been taken by one of the two candidates. The research work of the Department and its publications for the year, which especially concern the relationships of bacteria and other micro-organisms to disease, are included in the report to the Dean of the Medical Faculty.

DEPARTMENT OF BOTANY

Professor L. M. Underwood

I have the honor to present to you the following report of the work of the Department of Botany during the academic year 1897–8.

The staff of the Department has remained unchanged during the year and consists of Dr. Carlton C. Curtis, Tutor, and Dr. John K. Small, Curator, in addition to the Professor in charge. Dr. Curtis has conducted five courses, and Dr. Small, in addition to the care of the library and herbarium, has conducted one course. Both are able and deserving men and have proved themselves satisfactory assistants in the highest degree.

The following will show the Collegiate and University courses offered, with the attendance during the year:

Course I	12	Collegiate courses.
Course III	5	
Course IV	2	
Course V	3	
Course VII	5	
Course VIII	37	
Course IX	1	University courses.*
Course X	4	
Course XI	2	
Course XII	3	

The Fellow in Botany, Mr. Marshall A. Howe, has continued the work he commenced last year on a monograph of the Hepaticæ of California, which has been brought to completion and presents a most thorough and masterly treatment of the subject. In addition to his studies of the Californian species he has brought under review many of the species of other portions of America and of Europe, and in the case of the genera *Anthoceros* and *Porella* has made complete revisions of the North American species. These with other papers have been published as "Contributions" from the Department. His thesis is illustrated with an extensive series of plates which have been prepared entirely by himself in the most careful and painstaking manner.

The additional work entailed on the staff by the labor of moving and readjustment to new conditions at the new site, together with the necessities of equipping laboratories essentially from the foundation, added to the increase of the number of students over the past year, have too largely taken the time of the staff, so that independent research has been sadly interrupted. Dr. Curtis has completed and published his *Text-Book of Botany* (Longmans, Green & Co.), which is a highly creditable work; Dr. Small has continued his work on the flora of the Southern States on which he has been working for several years, and has completed the preliminary draft of the manuscript; this has been an enormous amount of work and has involved the description of nearly four thousand species of plants directly from the specimens.

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* These numbers correspond to those given in the Announcement for 1897–98, School of Pure Science.

Other important researches are in progress. Mr. E. O. Wooton has continued his work on the flora of New Mexico and has brought to light a considerable number of new species from that little known region. Professor F. E. Lloyd has been diligently at work on morphological problems connected with the Coniferæ and has published two important "Contributions." Dr. A. J. Grout, in addition to his thesis which was published as No. 2 of vol. vi., *Memoirs of the Torrey Botanical Club*, has continued his work of revision of the American Hypnaceæ and has published a revision of the North American Eurhynchia. Professor E. S. Burgess is carrying on a series of researches with reference to the genus *Aster* which will reach publication during the coming year. Mr. Rydberg's monograph of the Potentilleæ forms the second volume of the *Memoirs* of the Department (quarto), is finely illustrated with 112 full-page plates, and represents a marked contribution to science.

The fifth volume of the "Contributions from the Department of Botany of Columbia University" has been completed with the issue of Nos. 121–125, and volume vi. has been well advanced with Nos. 126–145. These numbers have been prepared by the following contributors: L. M. Underwood (2), C. C. Curtis (1), J. K. Small (5), M. A. Howe (3), P. A. Rydberg (1), F. E. Lloyd (2), E. O. Wooton (1), A. J. Grout (1), Mrs. E. G. Britton (1), G. V. Nash (3), E. P. Bicknell (3), Miss A. M. Vail (2).

Mention should be made of the voluntary work of several botanists who, as associates in the Torrey Botanical Club, have rendered valuable service to science as well as to the value of our collections and contributions by their labors. Notable among these are Mrs. Elizabeth G. Britton, who has had the special care of the collection of mosses; Miss Anna Murray Vail, who has undertaken the revision of the Asclepiadaceæ and certain genera of the Leguminosæ; Mr. George V. Nash, of the New York Botanical Garden, who is well known as a specialist in the Gramineæ; and Mr. E. P. Bicknell, whose careful work in local botany is favorably received.

It is worthy of note that the *Illustrated Flora of the Northeastern United States and Canada*, which has been largely based on the material contained in our herbarium, is completed in three large volumes with over four thousand illustrations. The work has been largely accomplished by the untiring energy of Dr. N. L. Britton, Emeritus Professor of Botany, and its completion is a matter of deep congratulation to the Department.

The only exploration of note that has been accomplished during the year directly connected with the Department is that of Mr. E. O. Wooton in Southeastern New Mexico. With funds that were raised outside the Department appropriation, Mr. Wooton made a three months' excursion into portions of the Territory that had never been explored, and into others whose flora was only known from the merest fragments that had been collected by the early explorers of the Pacific Railroad and Mexican Boundary Surveys. Some six hundred species of plants were secured, and sets were made for distribution to other herbaria. The results of the expedition have not been entirely made known, but have resulted not only in the discovery of a new genus and several species new to science, but also in determining the geographic distribution and ecological relations of that little known but highly interesting flora. It is a matter of congratulation that, at the close of his period of study with us, Mr. Wooton assumes the charge of the Department of Botany in the New Mexico Agricultural College, where he will be able still further to co-operate with us in the study of the flora of that region.

The greatest demand for the Department is additional teaching force; except for the single course cared for by Dr. Small, the care of eight graduates whose major is Botany, as many graduate minors, and six courses of undergraduate work, each involving from six to eight hours laboratory supervision, besides the necessity of arranging the work of two classes in two divisions each, has devolved upon the head of the Department and one tutor! Satisfactory research cannot be accomplished under such conditions, although the Department is doing all in its power to supply the demands made upon it. The added requirement for the single course given in one of the Schools of Applied Science necessitates additional laboratory work for at least two additional sections. A more satisfactory greenhouse, which would furnish proper facilities for the cultivation of such plants as are needed for direct experiment, and with modern facilities for heating and lighting, and space for physiological experimentation, is also greatly needed. It would seem that this could be combined with a general house in which plants for decorative purposes could be cultivated, and thus serve as a useful and attractive addition to the University grounds.

During the year extensive changes have been made in the Department of Botany, owing to the possibility of establishing laboratory facilities at the new site. Morphological and physiological laboratories have been equipped with the facilities for first-class undergraduate work. Apparatus has been selected with great care, in the belief that it is best to have the most satisfactory obtainable, even if less is obtainable at once. The rooms and facilities at the new site have proved admirable for our purposes. The time is not distant when additional rooms must be provided in the unassigned floor-space of Schermerhorn Hall for the necessities of undergraduate work. This is especially the case when we consider the fact that for certain of the graduate minor courses the work can be more satisfactorily accomplished at the University rather than the more distant Botanical Garden. Pending the construction of the Museum building at Bronx Park, temporary rooms for the graduate students have been provided in our present floor-space.

The additions to the herbarium which had been accumulating for some years have all been mounted, and, so far as the cases will permit, have been distributed to their respective compartments. The donations and acquisitions of the past year are still unmounted. During the year the extensive algal collections, which have been accumulating from various sources, have been mounted and put in place. The private collection in this group belonging to the Professor of Botany has also been deposited with the University and included in the same series for convenience of study. Each sheet is marked with a designative stamp.

DEPARTMENT OF GEOLOGY

Professor J. F. Kemp

1. Educational Staff.

This has consisted of J. F. Kemp, Professor; Alexis A. Julien, Instructor and Curator; Arthur Hollick, Tutor; Gilbert van Ingen, Curator.

It will be noted that Dr. Julien was transferred from the Chemical Department to the Geological at the beginning of the year.

2. University Courses Given and Attendance on Each.

Geology III. Economic Geology:

- 3 Graduates, candidates for M.A. and Ph.D., taking this as minor or part of major.
- 3 Special students.
- 19 Fourth-year students from the School of Mines.

Geology VI. Petrology:

- 4 Graduates, candidates for Ph.D.—2 majors, 2 minors.

Geology VII. Paleontology:

- 1 Graduate, candidate for Ph.D.—part of major.

Geology IX. Paleobotany:

- 3 Graduates, candidates for Ph.D.—minors.

Geology I. General Geology:

- 2 Seniors, College.
- 4 Juniors, "
- 1 Sophomore, "
- 4 Specials.

Geology II. General Geology:

- 38 Applied Science.
- 3 College.
- 4 Graduates.
- 1 Special.

3. The Fellow in Geology has been John Duer Irving, A.B. During the summer of 1897 Mr. Irving was a member of the U. S. Geological Survey party of Dr. Whitman Cross in Southwestern Colorado. He stayed with it until October, and then returned to college, making some collections for us at the Spanish Peaks *en route.*

During the year he has taken our Courses VI and VII for his major, and Chemistry and Mineralogy for his minors. He will take his Ph.D. in 1899 if our expectations are realized, and during the summer of 1898 will be engaged in field-work for his thesis, in the Black Hills. He took the degree of M.A. at Commencement, 1898.

4. Researches and Publications of Department. Professor Kemp has worked on his Adirondack collections, as briefly set forth under the next topic. He has also prepared for the *Mineral Industry* of the current year a review of the "Telluride Gold Ores" the world over, and a further paper on the "Titaniferous Iron Ores of the Adirondacks," for the *Nineteenth Annual Report* of the Director of the U. S. Geological Survey. A number of smaller papers have also been issued.

Dr. Julien has been completing a series of investigations on building-stones, so far as his duties as Curator admitted. Some of the results were summed up in a lecture before the Franklin Institute, in Philadelphia, in April, and will be printed in their journal.

Dr. Hollick's work on Block Island, as described under the next topic, has been issued in the *Annals of the New York Academy of Science*, xi., pp. 55–88, Plates II.–IX. His first report on the connection between the present and the fossil flora and silva of New Jersey, is now in press in the *N. J. Geological Survey.* He has continued his investigations of the paleobotany of the Cretaceous on Staten Island and the neighboring mainland with gratifying results, which are now in press in the *Annals of the New York Academy of Sciences.* His revision of the incomplete manuscript which was prepared by the late Professor J. S. Newberry, for a monograph of the U. S. Geological Survey, on "The Later

Extinct Floras of North America," has been completed, and is now in press at Washington.

Mr. van Ingen is studying a most interesting fauna of Niagara Age from Arkansas, and will complete it the next year.

Mr. T. G. White has continued his investigations of the Trenton fossils in the valley of Lake Champlain, and during the vacation will probably complete them, so that his thesis can go to press in the fall. He has also issued, in connection with the work of Professor Crosby, of the Massachusetts Institute of Technology, a paper entitled "A Contribution to the Petrography of the Boston Basin" (*Proceedings Boston Soc. Nat. Hist.*, xxviii., 117–156, Plates 1–5).

Mr. J. D. Irving has investigated the "Contacts of the Bergen Hill Diabase," and has written a thesis for his Master's degree upon their petrography.

Mr. B. F. Hill has studied and described a series of rocks collected for the most part in unexplored parts of Wyoming. His results were prepared for a Master's thesis.

5. Professor Kemp continued field-work in the Adirondack region during July, August, and September—both for the N. Y. State Survey and the U. S. Geological Survey. The former work was carried on with the assistance of D. H. Newland, Fellow in Geology last year, and B. F. Hill, Scholar in Geology, 1897–98. The crystalline rocks of Warren County were mapped in large part, and portions of Hamilton and Washington counties were traversed. The work for the U. S. Survey was located among the high peaks in Essex County, and was done with the assistance of Charles Fulton, E. M., '97. A report has been submitted to Professor Hall, and a paper on the Titaniferous Iron Ores of the Adirondacks has been prepared for the *Nineteenth Annual Report* of the Director of the U. S. Geological Survey.

Dr. Arthur Hollick was a member of a commission that critically examined the Trenton gravels last June with reference to their stone implements. Later he was a month on Block Island investigating its geology and botany, being supported in part by our summer-school appropriation and in part by the John Strong Newberry fund of the Scientific Alliance of New York. The results of his work have been printed as stated under 4.

Dr. Hollick has also been investigating the relations of the present forest growth of New Jersey to the fossil flora and silva and to the geological formations. One report has been submitted to the New Jersey State Geologist, under whose direction the work was done, and the work is being continued. Some very interesting results have been attained.

Dr. Hollick has continued the discovery of new fossil plants on Staten Island, and has written one paper on them that is now in press.

Mr. van Ingen conducted the geological part of the Summer School of Mining on Lake Superior, and on his return collected fossils in Indiana and Ohio. He was, however, chiefly occupied with the removal to the new site.

6. *Recommendations.* This Department needs, especially, to be strengthened in Physical Geography, as has been recommended in previous reports. It is appreciated that this is unattainable at present, and that co-operation with the Teachers College, and the throwing open of the courses offered by Professor Dodge, have helped to fill the previous lack, but it is desirable in the extreme that university courses and work in this subject should be anticipated, and should be established with suitable equipment of maps, models, and books. In paleontology and stratigraphical geology there is also room for at least an adjunct professor and ultimately for a Department.

7. No Department of the University has been more facilitated and aided in the prosecution of its work by the commodious quarters of the new buildings, than this one. Our surroundings have proved a constant source of inspiration to renewed efforts in behalf of the scientific reputation of the University.

DEPARTMENT OF MATHEMATICS

Professor J. H. Van Amringe

I submit herewith my report on the Department of Mathematics for the academic year 1897–98, so far as the operations of the same are related to the School of Pure Science.

1. The staff of the Department during the past year has been as follows:

J. H. Van Amringe, Ph.D., L.H.D., LL.D.,	Professor and Head of Department.
Thomas S. Fiske, Ph.D.	Professor.
Frank N. Cole, Ph.D.	Professor.
James Maclay, C.E.	Instructor.
J. Brace Chittenden, Ph.D.	Tutor.
Cassius J. Keyser, A.M.	Tutor.
George B. Germann, A.B.	Assistant.

2. The following is an account, in tabular form, of the courses, number, and subjects, by whom given, and by how many attended:

COURSES AND ATTENDANCE

Instructors	Courses	Half-Year	Hours per Week	Students	Total
	(Number and subject as in catalogue 1897–98)				
Prof. Fiske	VIII. Advanced Calculus	1st	3	3 A.M. 1 Sp. 1 LL.B.	5
Prof. Fiske	IX. Differential Equations	2d	3	3 A.M. 1 Ph.D. 1 Sp. 1 LL.B.	6
Prof. Cole	XIV. Theory of Equations and Introduction to Modern Algebra	Both	3	2 A.M.	2
Dr. Chittenden	XV. Theory of Invariants	Both	3	1 Ph.D.	1
Mr. Maclay	XVII. Analytical Theory of Curves of Double Curvature and Curved Surfaces	Both	3	4 Ph.D.	4
Prof. Cole	XVIII. Theory of Substitutions	Both	3	1 Ph.D.	1
Prof. Fiske	XIX. General Theory of Functions and Elliptic Functions	Both	3	6 Ph.D. 1 A.M.	7

In addition to the courses noted above, the Department has given five courses in the College and two courses in the Schools of Applied Science.

3. Meetings attended by the instructors and university students of the Department were held at intervals of two weeks during the second half-year, and at them the students were required to present lectures, reports, or essays upon previously assigned topics. Lectures were also occasionally delivered by the instructors. The following subjects were thus discussed:

I. The Teaching of Mathematics at the University of Berlin...................... Mr. Maclay.
II. The Geometry of Pseudo-Spherical Surfaces .... Mr. Schlesinger.
III. The Invariants of a System of Five Points in a Plane.......................... Mr. Kasner.
IV. Functions having Singular Lines and Regions............................ Mr. Kretz.

In addition, discussions were held based upon the several chapters of Professor Felix Klein's *Vorträge über ausgewählte Fragen der Elementargeometrie.* Each university student of the Department in turn led such a discussion.

4. The following is a list of the mathematical publications of the members of the Department during the year:

PUBLICATIONS

Prof. Thomas S. Fiske—" Briot and Bouquet's Elements of Analytical Geometry of Two Dimensions, Translated and Edited by J. H. Boyd " (Review), *Bulletin of the American Mathematical Society*, vol. iii., p. 256.—" Recent Text-Books of the Calculus " (Review), *Bulletin of the American Mathematical Society*, vol. iv., pp. 237, 238, 278–283.

Prof. F. N. Cole—" American Mathematical Society " (Reports), *Science*, vol. vi., pp. 627, 953; vol. vii., pp. 238, 718.—" The Fourth Summer Meeting of the American Mathematical Society " (Report), *Bulletin of the American Mathematical Society*, vol. iv., pp. 1–11.—" The

October Meeting of the American Mathematical Society (Report), *Bulletin of the American Mathematical Society*, vol. iv., pp. 87–92.—"Recent Mathematical Books" (Reviews), *Science*, vol. vi., pp. 958–960; vol. vii., pp. 102–104.—"The February Meeting of the American Mathematical Society" (Report), *Bulletin of the American Mathematical Society*, vol. iv., pp. 291–295.—"The April Meeting of the American Mathematical Society" (Report), *Bulletin of the American Mathematical Society*, vol. iv., pp. 415, 416.

Mr. C. J. Keyser—"The Relations of Analysis and Mathematical Physics, by Professor Henri Poincaré" (Translation), *Bulletin of the American Mathematical Society*, vol. iv., pp. 247–255.

During the past year Professors Fiske and Cole have continued their editorial work upon the *Bulletin of the American Mathematical Society*, of which another volume has been completed, the seventh since the foundation of the journal. In this work they have had the co-operation of Professor Ziwet, of the University of Michigan, and Professor Morley, of Haverford College. Professor Cole has, in addition, continued to serve the American Mathematical Society as its Secretary.

5. The following is a list of papers presented to learned societies and of public lectures by members of the Department of Mathematics:

LECTURES AND ADDRESSES

Mr. JAMES MACLAY:

Meeting of the American Mathematical Society, Columbia University, New York, February 26, 1898.

"Double Minimal Surfaces whose Minimal Curves have only Two Points on the Circle at Infinity."

Mr. J. B. CHITTENDEN:

Meeting of the Mathematical Section of the Brooklyn Institute, December 27, 1897.

"Infinity as a Mathematical Concept."

Mr. C. J. Keyser:
Annual Meeting of the American Mathematical Society, Columbia University, December 29, 1897.
"Some Theorems in *n*-dimensional Space."

6. Of the twelve students who during the past year have pursued university courses in mathematics, six have made mathematics their major subject, two astronomy, one mechanics, one chemistry, one electrical engineering, and one law. Two students, having mathematics as their major subject, have completed the requirements for the degree of Master of Arts, viz.:

Emily Matilda Coddington,
London University, A.B., 1896.
Minor subjects: Mechanics; Greek.
Essay: History of Determinants.
Edward Williams White,
Georgetown College, Ky., B.S., 1884.
Minor subjects: Astronomy; Mechanics.
Essay: Taylor's Theorem.

DEPARTMENT OF MECHANICS

Professor R. S. Woodward

Staff and Instruction.—The teaching staff of the Department remained the same during the year as during the two preceding years, namely:

R. S. Woodward, Ph.D	*Professor of Mechanics.*
M. I. Pupin, Ph.D.	*Adjunct Professor of Mechanics.*
J. C. Pfister, M.A.	*Tutor in Mechanics.*
Wm. H. Freedman, C.E., E.E.	*Tutor in Mechanics.*

The courses of instruction given during the year, and the number and classification of students in attendance, are shown in tabular form below. The numerals and titles of the courses are those given in the last annual Announcement of the School of Pure Science.

Instructors	Courses	Hours per Week	Students
Prof. Woodward	I. Analytical Mechanics	3	46 Eng., 3 Grad.
Mr. Pfister	II. Elementary Mechanics	2	10 A.B.
Mr. Pfister	III. Theoretical Mechanics	2	5 Grad., 2 Sp'l
Prof. Pupin	IV. Thermodynamics	3, first half-year	64 Eng., 1 Chem.
Mr. Pfister	V. Elementary Thermodynamics and Hydromechanics	2	4 Chem., 1 Sp'l
Prof. Pupin and Mr. Freedman	VI. Theory of Dynamo and Motor	3, first half-year	27 Eng.
Prof. Pupin and Mr. Freedman	VII. Theory of Direct-Current Dynamo and Motor	3, second half-year	27 Eng.
Prof. Pupin	VIII. Theory of Alternators and Transformers	3, first half-year	22 Eng.
Prof. Pupin	IX. Theory of Variable Currents	3, second half-year	22 Eng.
Prof. Woodward	X. Advanced Mechanics	2	1 Grad., 6 Eng., 1 Sp'l
Prof. Woodward	XI. Theory of Potential Function	2	9 Grad., 9 Eng., 1 Sp'l
Prof. Pupin	XV. Electro-Magnetic Theory of Light	2	3 Grad.

For remarks concerning the work of the year as regards undergraduates reference may be made to the report of the Department to the Dean of the Faculty of Applied Science. The reader may be referred also to the same report for some statistical information with reference to students who have pursued Analytical Mechanics in the Department during the past five years.

The most noteworthy feature of the graduate work is the increase in the number of candidates for the higher degrees who have pursued courses in Mechanics during the year, this number being nearly double that of the preceding year.

The Department suffered a sad loss in the untimely death of Mr. Joseph G. C. Cottier, Fellow in Mechanics. A sketch of his life and work is given in No. XIX. of the *University Bulletin;* and reference is also made to his connection with the University in the current report of the Dean of the School of Pure Science.

Additions to Equipment.—With the transfer to the new site the Department finds itself provided for the first time with adequate lecture-room space. It is also provided with an excellent laboratory which promises to be of great service in electromechanical work. Several important additions to the apparatus of this laboratory were made during the year. Among these are the following:

(a) An artificial electric cable of 500 miles length. The accompanying condensers have stood a test of 3000 volts, and the coils are arranged in such a way that the ground leakage (distributed along the line) and the self-induction can be changed within very wide limits and very conveniently. It is believed that this is a quite unique piece of apparatus, and that it will enable the Department to carry out some investigations in the domain of electric wave propagation and its application to telegraphy and telephony.

(b) An optical resonating telephone and double bridge for measuring amplitudes and phases of complex harmonic currents.

(c) A set of Hertzian oscillators and reflectors.

The laboratory is now fairly well equipped for carrying on investigations in any parts of the electromagnetic theory.

Publications.—The publications of members of the Department made up to the end of the last calendar year are detailed in No. XIX. of the *University Bulletin* and need not be recapitulated here.

In No. 424 of the *Astronomical Journal* (January, 1898), Professor Woodward published a paper "On the Gravitational Constant and the Mean Density of the Earth." This paper gives a new theorem which furnishes a precise numerical value of the product of those two quantities.

Investigations.—Professor Woodward has been engaged during the year on the problem of the mass and mass-distribution of the earth's atmosphere. Papers on the mathematical and mechanical aspects of this problem have been read during the year before the American Mathematical Society, the

New York Academy of Sciences, and the National Academy of Sciences. He has also presented the following papers before the American Mathematical Society: 1. On the integration of a system of simultaneous linear differential equations; 2. On the differential equations defining the Laplacian distribution of density, pressure, and acceleration of gravity in the earth; 3. On the significance of the product of the gravitational constant and the mean density of the earth. The last of these communications is supplementary to the one published in the journal referred to above, and shows how the product in question is related to the periodic time of a small satellite revolving under gravitation close to the earth along the equator.

Recently Professor Woodward has designed and investigated two new forms of apparatus for direct measurement of the acceleration of gravity. It is hoped that one or both of these forms may be applied during the coming year to determine the acceleration of gravity on the University grounds.

Professor Pupin, with the assistance of Messrs. Lowther, Lobo, McClure, and Lichtenstein, of the graduating class, has made an investigation of the amplitude and phase of the fundamental component of a distorted alternating current. The results of this investigation will soon be published.

Mr. Pfister has continued work on his bibliography of mechanics, which is now quite complete and which promises to be very useful to members of the Department and to graduate students.

DEPARTMENT OF MINERALOGY

Professor ALFRED J. MOSES

The teaching staff of the Department during the year 1897–98 consisted of Professor Moses, Dr. Luquer, and Mr. Whitlock.

The following is a tabulated statement of the courses of instruction given during the year and of the attendance thereon:

	Courses	Pure Science			Barnard	Applied Science			Columbia College	Totals
		Special	A.M.	Ph.D.	Ph.D.	1st Class	2d Class	4th Class		
I	Blowpipe Analysis	3	...	...	...	34	...	...	1	38
II	Crystallography	2	1	...	...	34	...	...	1	38
III	General Mineralogy	5	4	1	...	...	...	...	...	10
IV	Mineralogy Silicates	2	...	1	...	32	...	...	1	36
	Mineralogy Non-Silicates	2	...	1	...	...	23	...	...	26
V	Minerals of Building-Stones	...	1	...	...	...	18	...	...	19
VI	Optical Mineralogy	...	1	...	...	...	15	...	...	16
VII	Optical Mineralogy Longer Course	...	...	1	...	...	...	...	...	1
VIII	Physical Crystallography Short Laboratory Course	...	...	...	...	...	...	2	...	2
IX	Physical Crystallography Longer Course	...	1	...	1	...	...	...	...	2

That there has been a marked increase in attendance is shown by the following comparison :

Course	Pure Science and Barnard			Applied Science			Total Increase
	96–97	97–98	Increase	96–97	97–98	Increase	
I	..	3	3	22	34	12	15
II	..	3	3	22	34	12	15
III	1	10	9	..	..	..	9
IV	1	3	2	47	56	9	11
V	..	1	1	16	18	2	3
VI	1	1	..	15	15	..	..
VII	..	1	1	..	..	..	1
VIII	..	..	..	..	2	2	2
IX	1	2	1	..	..	..	1

This year the publications of the Department have been limited to text-books designed as a groundwork for the courses offered. For the courses in Physical Crystallography Professor Moses has printed of a work on Characters of Crystals: Part I., "The Geometrical Characters," and Part II., "The Optical Characters," and the manuscript for the remainder of the book is nearly completed. In connection with this work a large number of experiments have been made, notably a series on Etch Figures by Professor Moses and Mr. Whitlock. For the courses in Optical Mineralogy, which deal especially with the study of minerals in thin sections, Dr. Luquer has completed a text-book entitled *Minerals in Rock Sections*, and also a Table for Determination of Minerals in Rock Sections.

The plans for the improved arrangement of the collections outlined in the last annual report are being followed. The *Economic Collection*, being most essential to the undergraduates, was first arranged, and then, more slowly, the specimens designed for the systematic collection were selected and are still undergoing a careful re-examination as to identity and locality, a careful record being made of unsatisfactory specimens and missing species. When this work is completed the collection may well serve as a standard for reference. The smaller collections have been provisionally installed but not revised.

During the year the additions to the collections have been limited to gifts and to the purchase of missing species and varieties. Eleven of the more recently described species were obtained.

It is to be regretted that a plan cannot be devised for the combined display of the three small collections of meteorites now in the Mineralogical, Chemical, and Geological museums, and an attempt made to supplement them.

Changes and improvements in the equipment are being made as rapidly as possible to meet the needs of the increasingly complex courses. The new optical laboratory is divided by heavy curtains into six compartments, each with independent table, electric lamp, and gas jets; two of the compartments are fitted with the Laspeyere's apparatus for monochromatic light. In the blowpipe laboratory gas blowpipes have replaced oil lamps. Several of the older pieces of apparatus have been modernized and new apparatus has been purchased, including:

Fuess goniometer 4a, for student work.
Goldschmidt two-circle application goniometer.
Goldschmidt goniometer lamp, with Welsbach net.
Kundt apparatus for pyroelectricity.

Bohnenberger-Fechner Electrometer.

Senarmont apparatus for heat conductivity.

Apparatus for producing double refraction by pressure, bending, and heating.

A portrait of Dr. Egleston, Professor Emeritus, has been presented to the Department by former associates in mineralogical work.

The transfer of books from the general library has been made and the departmental library now consists of about 750 volumes supplemented by 250 boxes of pamphlets, alphabetically arranged, and a catalogue of nearly 20,000 cards.

For the better correlation with the courses in graduate work in the Department of Geology it is proposed to offer a course in Systematic Mineralogy and to advise students undertaking a two years' study to pursue one year Physical Crystallography and Systematic Geology, the other year Systematic Mineralogy and Petrology, the work in Mineralogy in one year serving as a groundwork for that in Geology the next.

DEPARTMENT OF PHYSICS

Professor O. N. Rood

I have the honor to submit the following report of work accomplished in the Physical Department during the year 1897–98.

In spite of the confusion and various drawbacks attendant on moving to the new site, the lectures were given on schedule time, and the opening of the laboratories was delayed only two weeks. The matter contained in this report is arranged under various heads, and will be readily intelligible.

CHANGES IN STAFF

At the commencement of the college year two new assistantships were created, and to them were appointed Frank L. Tufts, Ph.D., and William S. Day, Ph.D. Dr. Tufts is a graduate of Antioch College and Harvard University, and was University Fellow in Physics for two years; he received his Doctor's degree at the last Commencement. Dr. Day graduated from Columbia College in 1884, and has since pursued graduate studies and investigations at the Johns Hopkins University, where he received the degree of Doctor of Philosophy last summer. During the spring, the resignation of Dr. Henry E. Keyes, Assistant, was received, and to fill the vacancy Mr. William C. Andrews, E.E., a graduate of the School of Engineering of the Class of 1895, was appointed.

LECTURE COURSES

Course I—General Physics—Sound and Heat (First Half-year); Light and Electricity (Second Half-year).
Prof. Rood and Mr. Gordon.

First-year students in the Schools of Mines, Chemistry, and Engineering	97
Freshmen in the College	16
Freshman in the College (Optional)	1
Sophomores in the College	37
Juniors in the College	3
Juniors in the College (Optional)	2
Senior in the College	1
Specials in the College	3
University students	4
Total	164

Course II—Sound (First Half-year); Magnetism and Electricity (Second Half-year).
Prof. Rood.

Freshmen in the College	6
Sophomores in the College	15
Juniors in the College	10
Specials in the College	2
Total	33

Course III—Units and Measurements (First Half-year); Exact Electrical Measurements (Second Half-year).
Prof. Hallock.

Second-year students in the Schools of Mines, Chemistry, and Engineering	78
University students	2
Total	80

Course IV—Light (First Half-year); Heat (Second Half-year).

Prof. Rood.

Senior in Columbia College	1
University students	5
Total	6

Course V—Modes of Designing and Constructing Apparatus (First Half-year).

Prof. Hallock.

Students in School of Engineering (Optional).	7
University students	3
Total	10

Course VI—Meteorology (First Half-year).

Mr. Gordon.

Students in Schools of Applied Science (Optional)	5
University students	2
Total	7

Course VII—Electrical Manipulation (First Half-year); Theoretical Comparison of Electrical Methods (Second Half-year).

Mr. Parker.

Second-year students in the course of Electrical Engineering (Optional)	20
University student	1
Total	21

Course VIII—Undulatory Theory of Light (Second Half-year).

Prof. Hallock.

Students in School of Engineering (Optional).	6
University students	5
Total	11

Course XXXI—General Physics (for students in medicine).

Prof. Hallock.

First-year students in College of Physicians and Surgeons	150

With the exception of the students of the first year in the Schools of Mines, Chemistry, and in the courses of Civil and

Electrical Engineering, and a few advanced students, those in attendance on the foregoing courses received instruction in practical work in the laboratories of the Department. The following summary shows the division of the practical work, and the number of students in each course:

LABORATORY COURSES

Students in Columbia College.	
Two-hour introductory course in the laboratory.	
Juniors	11
Sophomores	60
Freshmen	17
Special students	3
Total	91
Four-hour course in laboratory.	
Sophomore	1
Four-hour advanced course in laboratory.	
Seniors	2
Six-hour course in laboratory.	
Senior	1
Junior	1
Students under the Faculty of Applied Science.	
Second year.	
Laboratory course in Electrical Engineering	41
Laboratory course in Civil Engineering	19
Laboratory course in Mining Engineering	11
Laboratory course in Chemistry	8
Total	79
First year.	
Laboratory course in Mechanical Engineering	13
Laboratory course in Chemistry	3
Total	16
Fourth year, laboratory course.	
Students engaged in special thesis work	2
College of Physicians and Surgeons.	
First-year students actually attending in the laboratories	172

Course IX	2	University students.
Course X	2	
Course XX	3	
Course XXV	3	
Total	10	
Special course in photography	1	
General laboratory courses	3	
Total	4	

The Barnard Fellowship has been held during the past year by Dr. Heinrich Ries, who has been engaged in investigating the physical properties of clays, and has carried on an extensive course of study in Europe, in addition to visiting the leading clay-fields. For several months he studied at the University of Berlin, and attended the International Geological Congress as the representative of Columbia University, and of the N. Y. Academy of Sciences. Dr. Ries has recently received an appointment as Instructor in Economic Geology at Cornell University.

No University Fellow was assigned to the Department during the past year, but a number of candidates for the University degrees, whose minor subject was Physics, have carried on original investigation with considerable success. W. D. Engle and A. Gotthelf have been engaged in photographing the arc spectrum of a number of substances under various conditions. L. L. Watters has investigated the fluorescent properties of certain organic compounds.

INVESTIGATIONS

Prof. O. N. Rood—On the electrical resistance of different kinds of glass; nearly completed.

H. C. Parker—On the E. M. F. of a cell composed of aluminium and two fluids; completed. The effect of liquid air on the electrical resistance of certain materials. These papers will be published soon. During August, 1897, Mr. Parker participated in an expedition of the English Alpine Club and the Appalachian

Mountain Club, which explored the Rocky Mountains of Alberta, N. W. T. Considerable topographical work was done by the party, and a map based on the results of their work is soon to be published in the Journal of the Royal Geographical Society.

C. C. Trowbridge—The specific heats of metals at low temperatures and methods relating to calorimetry ; to be published shortly.

H. S. Curtis—Certain adaptations of pinhole photography ; will be published soon.

T. G. White—The optical properties and characteristics of certain minerals of the hornblende and allied groups ; photomicrographic experiments on thin sections of various rocks, by ordinary and polarized light, to exhibit types of texture. This work will be published in a few weeks. During the summer Mr. White was employed by the New York State Museum in the field, to determine the physical characteristics and conditions which produced abrupt alterations in the deposition in the mechanical sediments in the silurian strata of Central New York. A report on this subject has already been transmitted to the State Museum.

Dr. F. L. Tufts—On the transmission of sound through various substances ; investigation not completed.

PUBLICATIONS

Prof. O. N. Rood—"On a Flicker Photometer," *Science*, June 4, 1898. "On the Quantitative Study of Color-Blindness," *Science*, June 11, 1898.

Prof. William Hallock—Review of Foster's Electricity and Magnetism, *Educational Review*, June, 1897. "Color Standards," *Science*, August 6, 1897. Review of Kohlrausch's Leitfaden der praktischen Physik, *Science*, August 13, 1897. Review of Parker's Systematic Treatise on Electrical

Measurements, *Science*, August 13, 1897. Review of Nichols and Franklin's Elements of Physics, *Educational Review*, November, 1897. "The Action of the Larynx in the Production of Voice," Report of the Ithaca meeting of the Physiological Society, December, 1897. "Oddities in Lantern Projection," *Photographic Times*, September, 1897. "Subterranean Temperatures," *Annual* of the Engineering Society of Columbia University, 1897. "Diffused Illumination," *Progressive Age*, March 1, 1898.

C. C. Trowbridge—"An X-Ray Detector for Research Purposes," *Annals N. Y. Academy of Sciences*, vol. xi., No. 2. "The Use of the Fluoroscopic Screen in Connection with Roentgen Rays," *Annals N. Y. Academy of Sciences*, vol. xi., No. 3.

Henry S. Curtis—"The Use of Spectacle Lenses for Landscape Photography," *The Photographic Times*, July, 1897. "An *A*daptation of a Telescope Lens for Photographic Work," *The Photographic Times*, October, 1898.

Theodore G. White—"A Contribution to the Petrography of the Boston Basin," *Proceedings of the Boston Society of Natural History*, vol. xxviii., No. 6, December, 1897. Review of "The Survival of the Unlike," *Asa Gray Bulletin*, vol. v., No. 3, June, 1897.

Dr. William S. Day—"A Reduction of Rowland's Value of the Mechanical Equivalent of Heat to the Paris Hydrogen Scale" (an abstract), *Report of the British Association for the Advancement of Science*, at Toronto, 1897, p. 559. "A Comparison of Rowland's Thermometers with the Paris Standard, and a Reduction of his Value of the Mechanical Equivalent of Heat to the Hydrogen Scale," *Physical Review*, vol. vi., p. 193, April, 1898.

Papers presented to learned societies and public lectures delivered by members of the Department of Physics:

Prof. William Hallock—"The Science of Voice Production," National Association of Elocutionists, July 2, 1897. "A Vertical Research Laboratory" and a paper on "The Calculated Curves of Vibrating Strings," Section of Astronomy and Physics, New York Academy of Sciences, November 2, 1897. "Note on the Deep Well at Reibnik," Section of Astronomy and Physics, New York Academy of Sciences, December 6, 1897. "A Make-Circuit Pendulum," Section of Astronomy and Physics, New York Academy of Sciences, March 7, 1898. Prof. Hallock also lectured on "Subterranean Temperatures" before the Engineering Society of Columbia University, and delivered an experimental lecture on "Color" before the students of the School of Architecture.

Mr. Herschel C. Parker—"Recent Explorations in the Rocky Mountains of Canada, including the first ascent of Mt. Lefroy," Public Lecture, New York Academy of Sciences, November 29, 1897. *Ibid.*, Brooklyn Institute, December, 1897. "The Canadian Alps," Newark Academy, March 18, 1898.

Mr. C. C. Trowbridge—"A New Method of Coloring Lantern-Slides, by which Uniformity of Tint and Definition of Outline are Obtained"; also a paper on "The Specific Heat of Metals at Low Temperatures," Section of Astronomy and Physics, New York Academy of Sciences, May 2, 1898.

Dr. William S. Day—"A Reduction of Rowland's Value of the Mechanical Equivalent of Heat to the Paris Hydrogen Scale," British Association for the Advancement of Science, Toronto, August 20, 1897. "Recent Experiments on the Specific Heat of Water," Section of Astronomy and Physics, New York Academy of Sciences, February 7, 1898. "A Convenient Modification of Mance's Method of Measuring the Internal Resistance of a Battery," Section of Astronomy and Physics, New York Academy of Sciences, April 4, 1898. Four monthly lectures on "Elementary Optics" before the Optical Society of the City of New York.

NEW APPARATUS

The meteorological apparatus presented to the University by President Low, and formerly located in the Observatory at Forty-ninth Street, has been transferred to this Department and is now installed on the roof of Fayerweather Hall, while the recording instruments are conveniently placed in the Library of the Department on the third floor.

1 Gramophone, presented by Davison H. Smith, Esq.

1 Large Double-Plate Electrical Machine, presented by Dr. Andrew H. Smith.

1 Small Boiler for generating steam in the Laboratory, presented by Mrs. W. P. Trowbridge.

1 Flicker Photometer, constructed by Prof. Rood.

2 D'Arsonval Galvanometers.

1 Adjustable Standard Condenser.

1 Large Battery (130 volts), for testing.

1 Adjustable Laboratory Condenser.

1 Colt Automatic Projection Lantern with special regulation and attachments.

2 Scissors-feed Lanterns for research work.

1 Photo-spectrograph.

2 Heavy-current Resistance Boxes.

2 Drum Chronographs.

3 Watch Chronographs.

2 Sets Model Verniers made in the Laboratory.

DEPARTMENT OF PHYSIOLOGY

Professor John G. Curtis

In the Department of Physiology instruction has been given by Professors J. G. Curtis and F. S. Lee, and by Drs. R. H. Cunningham and R. Hunt.

The following is a summary of the courses given during the year:

Course.		No. of students with candidacy for degree.	
I. General Physiology	6	Ph.D.	2
		A.M.	4
II. Physiology of Man and Higher Vertebrates		M.D.	412
III. Laboratory Work of Course I	6	Ph.D.	2
		A.M.	4
IV. Special Laboratory Work (special student)			1
V. Research	6	M.D.	2
		Ph.D.	1
		A.M.	1
		Special	2
			431
Names repeated			13
Corrected total			418

The researches carried on in the Department in 1897–98 by the members of the staff and workers under their direction were upon the following subjects:

The general physiology of secretion.

The form of the muscle-curve in the different muscles of the turtle.

The form of the muscle-curve in the different muscles of the frog.

The nature and causes of muscular fatigue.

The effect of inanition and fatigue upon the structure of muscle.

The physiology of the cardiac nerves.

The absorption of fat.

Absorption from the peritoneal cavity.

The influence of fasting upon the bactericidal action of the blood.

A method for the redistension of the collapsed lung.

Ether-anæsthesia by the rectum.

The effects of intestinal irrigation upon the arterial pressure, the renal secretion, intestinal absorption, and the body-temperature.

The effects of different anæsthetics upon the circulation in the kidneys.

The effects of antitoxins upon the kidneys.

The influence of iodothyrine upon the cardio-inhibitory fibres of the vagus.

The physiological action of strychnine.

The following publications by workers in the Department appeared during 1897–98:

F. S. Lee, Ph.D.—Physiology at the British Association. *Science*, October 8, 1897, N. S., vol. vi., p. 550.

The Functions of the Ear and of the Lateral Line in Fishes. *American Journal of Physiology*, vol. i., January 3, 1898.

R. H. Cunningham, M.D.—A Case of Acromegaly in a Dog. *The Journal of Comparative Medicine and Veterinary Archives*, July, 1897.

Aseptic Formalin Catgut. *The Medical Register* (Virginia), January 15, 1898.

The Cortical Motor Centres of the Opossum (Didelphys Virginiana). *The Journal of Physiology*, February 17, 1898, vol. xxii., No. 4.

The Restoration of Coördinated Volitional Movement after "Nerve-Crossing." *The American Journal of Physiology*, March 1, 1898, vol. i., No. 2.

Experimental Thyroidism. *The Journal of Experimental Medicine*, vol. iii., No. 2, 1898.

R. Hunt, M.D., Ph.D.—Review of Marcet's "A Contribution to the History of the Respiration of Man." *New York Medical Journal*, August, 1897, vol. lxvi., p. 195.

R. Hunt, M.D., Ph.D., A. Bookman, A.B., and M. J. Tierney, A.B.—Einige allgemeine Eigenschaften des Herzmuskels des Amerikanischen Hummer (Homarus Americanus). *Centralblatt für Physiologie*, July, 1897, vol. xi.

R. Hunt, M.D., Ph.D., and D. W. Harrington, M.D.—Notes on the Cardiac Nerves of the Opossum (Didelphys Virginiana). *The Journal of Experimental Medicine*, November, 1897, vol. ii.

Notes on the Cardiac Nerves of the Calf. *Ibid.*, November, 1897, vol. ii.

D. W. Harrington, A.M., M.D.—Contributions to the Physiology of the Cardiac Nerves in the Guinea-Pig. *The American Journal of Physiology*, May 1, 1898, vol. i., No. 3.

S. J. Meltzer, M.D.—Ueber Reizversuche mit Inductionsstromen am Tiermagen. *Archiv für Verdaungskrankheiten*, Band iii., Heft 2.

A Further Experimental Contribution to the Knowledge of the Mechanism of Deglutition. *The Journal of Experimental Medicine*, vol. ii., No. 5.

The Bactericidal Action of Lymph taken from the Thoracic Duct of the Dog. *The Journal of Experimental Medicine*, vol. ii., No. 6.

On the Paths of Absorption from the Peritoneal Cavity. *Journal of Physiology*, vol. xxii., p. 199.

On the Nature of the Cardiopneumatic Movements. *American Journal of Physiology*, vol. i., p. 117.

Ether-Anæsthesia by the Rectum. *Proceedings of the American Physiological Society, American Journal of Physiology*, vol. i., No. 2.

A Simple Method for the Redistension of the Collapsed Lung. *Ibid.*

R. C. Kemp, M.D.—Physiological Experiments with Intestinal Irrigation on Pulse Tension, Temperature, Renal Secretion, and Intestinal Absorption. *The New York Medical Journal*, January 29, 1898.

The following papers are in press:

R. H. Cunningham, M.D.—A Contribution to the Physiology of Fat Absorption.
Thyro-colloid in Myxœdema, a critical experimental study of the active principles of the thyroid gland (provisional title).

S. J. Meltzer, M.D.—The Influence of Fasting upon the Bactericidal Action of the Blood.

DEPARTMENT OF ZOÖLOGY

Professor Edmund B. Wilson (acting) *

1. Staff.—The staff of the Department during the year 1897–98 consisted of Professors Henry F. Osborn and Edmund B. Wilson; Adjunct Professor Bashford Dean; Gary N. Calkins, Tutor; Oliver S. Strong, Tutor; Henry E. Crampton, Lecturer; and James H. McGregor, Assistant. Professor Osborn has been absent on leave since the mid-year, to remain until February, 1899. The Department has suffered a serious loss through the death of Bradney B. Griffin, formerly Fellow in Zoölogy, who, though not officially connected with the staff, had co-operated with it in many ways and was the author of important researches now in course of publication. The only change for the coming year is that of Professor Wilson's title from Professor of Invertebrate Zoölogy to Professor of Zoölogy.

2. Courses and Attendance.—With the completion of the new laboratories and the establishment of the new undergraduate curriculum, a far more thorough and satisfactory course of study in Zoölogy has been made possible, and the influence of the changes thus effected is felt throughout the entire course up to the most advanced graduate work. Students may now follow a homogeneous and progressive course of study, extending from the beginning of the Junior year through two years of undergraduate and one, two, or three years of graduate work. The first year's work (Junior) has been increased from a three-hour course to one of four or six hours at the option of the student; while the second year's work (Senior) has been increased to a six-hour course. Junior students are thus enabled to take an elementary, shorter culture course, or a longer one in preparation for a thorough year's work in the Senior year, and this in its turn leads directly to graduate work, or to the study of medicine. Through these changes not only has the work hitherto attempted been rendered more thorough, but it has become possible to add optional courses in histology and embryology in addition to those in general biology and zoölogy, and the entire work of the Department has been placed upon a higher plane.

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* Professor Henry F. Osborn absent on leave.

Instruction has been given to 81 students, of whom 56 were undergraduates and 25 graduates. Of the latter, 9 are taking Zoölogy as a major for the Ph.D. degree.

Instructors	Courses	Hours per Week	Students	Total
	[In the School of Applied Science]			
Prof. Dean Dr. Calkins	I. Elementary Zoölogy	2	16 first-year	16
	[In Barnard College]			
Dr. Calkins	I. Elementary Zoölogy	3	16	16
	[In Columbia College]			
Prof. Wilson Prof. Dean Dr. Calkins	II. Elementary Biology	6–9	2 special 17 B.A. 1 Ph. D.	20
Prof. Dean Dr. Calkins	III. General Zoölogy	9	2 B.A. 3 special 3 Ph.D.	8
	[University Courses]			
Dr. Strong	IV. Comparative Neurology		2 Ph.D. 2 M.D.	4
Prof. Osborn Prof. Wilson	V. Comparative Zoölogy	12	2 Ph.D. 1 A.M.	3
Prof. Wilson	VI. Comparative Embryology	6	3 Ph.D.	3
Prof. Wilson	VII. Cellular Biology	6	2 M.D. 5 Ph.D.	7
Prof. Osborn	VIII. Morphology of the Mammals	1–6	2 Ph.D.	2
Prof. Dean	IX. Morphology of the Fishes	1	1 special 2 Ph.D.	3
	XI. Advanced Biology and Research		6 Ph.D. 3 special	9

Dr. Franz Boas, of the Department of Anthropology, delivered a University Biological course of four lectures on the Statistical Study of Variation, and a number of single lectures on special topics were delivered by members of the staff and others. In addition to the regular class work a Journal Club has been held weekly throughout the year for reports and discussions upon recent literature by graduate students and members of the staff. In the second half-year a series of evening seminaries were given at the house of Professor Dean on the leaders of modern biological investigation, and these proved so successful that they will be repeated and extended next year.

3. Work of Fellow.—The work of Mr. Nathan R. Harrington, Fellow in Zoölogy, has been mainly concerned with the completion of his thesis on the Anatomy, Histology, Development, and Physiology of the Lime-Glands in the Earthworm, which is now in course of publication. Mr. Harrington has also been engaged in researches on the development of the parasitic gasteropod *Entoconcha* based on material collected by the Columbia Zoölogical Expeditions of 1896 and 1897 to the northwest coast; and with the co-operation of Dr. Leaming he has made a study of the effect of light of different colors and intensities on *Amœba*. He has read several papers based on these researches before the American Society of Naturalists and the biological section of the New York Academy of Sciences. In April he started with Dr. Hunt, of the Department of Physiology, on the Senff expedition to Africa, referred to below.

4. Researches and Publications.—The year has been an active one in research, and a large number of papers have been published or sent to press from the Department. Professor Osborn has continued his researches on the fossil mammals and reptiles of the western beds, has published a number of important papers on the palæontology of these groups, and has nearly completed the monographic book on the fossil Mammalia of America, on which he has long been engaged, in conjunction with Professor Scott, of Princeton University. Professor Wilson has carried out researches on the embryology of annelids and platodes, on the structure of protoplasm, and on the morphology of the centrosome and related subjects. Professor Dean has been engaged especially in researches upon the structure of the Devonian sharks and upon the embryological development of the primitive fishes *Bdellostoma* and *Chimæra.* Dr. Strong has continued his studies on the cranial nerves of the vertebrates, and has collected a large amount of material for the investigation of the brain. Dr. Calkins has seen through the press his extensive paper on the mitotic phenomena in *Noctiluca*, has completed a paper on the nuclear phenomena of Protozoa, has pursued investigations on the reduction problem in the flowering plants, and (with Mr. Keppel) has nearly completed a report on the hydroids of the northwest coast. Mr. McGregor has practically finished a paper on the spermatogenesis of the lower vertebrates. Mr. Crampton has brought to a conclusion his researches on the growth, maturation, and fertilization of the egg in the ascidians, and has carried out a large number of experiments on the grafting of moths. Dr. Mathews has completed an important research on the chemistry of staining-reactions, and has sent to press two extended papers on the histological and physiological phenomena of secretion. Other researches by graduate students include studies on the spermatogenesis of the insects (nearly ready for the press), by F. C. Paulmier; the fertilization and embryology of the teleost fishes, by F. B. Sumner; the structure and classification of the west coast nemertines, by B. B. Griffin; the morphology of the skull in chimæroid fishes, by R. W. Shearman.

Following is a partial list of the publications of the year, not including a considerable number of papers read before scientific societies but still unpublished:

Henry F. Osborn—The Extinct Rhinoceroses. *Memoirs of the American Museum of Natural History*, vol. i., part iii. (Several other papers not reported.)

Edmund B. Wilson—*The Cell in Development and Inheritance* (revised edition). Macmillan & Co., New York.

Considerations on Cell-Lineage and Ancestral Reminiscence. *Ann. N. Y. Acad. Sci.*

Parker & Haswell's Zoölogy (review). *Science.*

Bashford Dean—The Columbia University Zoölogical Expedition of 1896, with a brief account of the work of collecting in Puget Sound and on the Pacific Coast. (With others.) *Transactions N. Y. Acad. of Sciences*, xvi., pp. 33–42. Pl. I.

On a new species of *Edestus* from the Carboniferous of Nevada. *Ibid.*, xvi., pp. 61–69. Pls. IV–V.

New species and a new genus of American Palæozoic Fishes, together with notes on the genera *Oracanthus*, *Dactylodus*, *Polyrhizodus*, *Sandalodus*, *Deltodus*. (A posthumous memoir of Professor J. S. Newberry, with introduction and notes by Bashford Dean.) *Ibid.*, xvi., pp. 282–308. Pls. XXII–XXIV.

On the development of the Californian Hagfish, Bdellostoma stouti; Lockington. *Quart. Journ. Micr. Sci.*, xl., pp. 269–279. Pl. XVII.

Notes on the spawning habits of the brook lamprey, Petromyzon wilderi (with F. B. Sumner). *Transactions N. Y. Acad. of Sciences*, xvi., pp. 321–325. Pl. XVII.

Gary N. Calkins—Review of Cytologische Studien aus dem Bonner botanischen Institut. *Bull. Torrey Bot. Club*, xxiv., 6, 1897.

Columbia University Zoölogical Expedition, 1896. (With others.) *Transactions N. Y. Acad. of Sciences*, vi., pp. 33–42, 1897.

Chromatin-reduction and Tetrad-formation in Pteridophytes. *Bull. Torrey Bot. Club*, xxiv., 3, pp. 101–115, 1897.

Columbia University Zoölogical Expedition of 1897. *Science*, N. S., vi., 144, pp. 513–516.

Review of Delage et Herouard's La Cellule et les Protozoaires. *Science*, N. S., vii., 162, pp. 174–5.

O. S. Strong—The Innervation of the Lateral Line System. *Science*, May, 1898.

Henry E. Crampton—Some Grafting Experiments upon Lepidoptera. *American Morph. Soc.*, Ithaca meeting, December, 1897. Abstract in *Science*, vii., 163, Feb. 11, 1898.

The Fertilization of the Egg of *Molgula manhattensis*. *American Morph. Soc.*, Ithaca meeting, December, 1897. Abstract in *Science*, vii., 164, Feb. 18, 1898.

The Early History of the Egg of *Molgula manhattensis*. *Trans. N. Y. Acad. of Sciences*, Dec., 1897 (abst.); also abstract in *Anat. Anzeiger*, xiv., 13, 1898.

An Important Instance of Insect Coalescence. *Ann. N. Y. Acad. of Sciences*, xi., 1898.

J. H. McGregor—Semon on the Monotremes. *Science*, v., April 23, 1897.

C. Judson Herrick—The Cranial Nerve Components of Teleosts. *Anat. Anz.*, xiii., 16, 1897.

Owing to lack of funds the *Zoölogical Contributions*, consisting of collected memoirs from the laboratory, still remains unpublished, though material sufficient for several numbers has now accumulated. The *Journal of Comparative Neurology*, of which Dr. Strong is one of the active editors, has recently been much enlarged, and through the establishment of a board of collaborators, including among them the eminent neurologist, Professor Edinger, of Frankfort, Germany, is now enabled to offer greatly improved facilities for the publication of researches and the criticism of current literature in this field. The need of adequate means of publication in the other branches of zoölogy is increasingly felt, and nothing could more effectively further the university work of the Department than an endowment fund for this purpose.

5. Field-Work.—In field-exploration the year has been in some respects the most important in the history of the Department. The success of the first expedition to Puget Sound, sent out in 1896, led to the sending out of a second and more extended one, in 1897, to that region and to Alaska. The funds for this expedition were generously contributed by trustees and other friends of the University, many of whom had already subscribed to the expenses of the first expedition. The party, organized and conducted by Dr. Calkins, comprised in addition, Messrs. J. H. McGregor, B. B. Griffin, N. R. Harrington, F. P. Keppel, Professor E. B. Wilson, and Professor F. E. Lloyd. After a short stay at Port Townsend, on Puget Sound, the party proceeded to Sitka, Alaska, where several weeks were spent, and then returned to Port Townsend for the remainder of the season. Unfortunately nearly the whole of the Alaskan material, together with a number of valuable books and instruments, was lost through the wreck of the vessel on which the party was returning; but despite this loss the results attained at Port Townsend fully repaid the cost of the expedition. A third trip to the same region was planned for the summer of 1898, but this was abandoned on account of the death of Mr. Griffin.

Of even greater interest is the Senff expedition to Africa, which left New York in April, 1898, in quest of the developmental stages of the Crossopterygian fishes. The development of *Polypterus* and *Calamoichthys*, now wholly unknown, is generally regarded as one of the great future prizes of embryological research; for these low and generalized fishes are the last remnants of an ancient and most interesting race, now surviving only in the fresh waters of Africa, and a knowledge of their development from the egg is expected to throw light on many disputed problems in the evolution of the higher animals. Charles H. Senff, Esq., to whom the Department already owes the greater part of its library, has most generously provided the funds to meet the expenses of the long and costly trip. The party includes N. R. Harrington, the present Fellow in Zoölogy, and Reid Hunt, Tutor in Physiology. It was their first intention to make the attempt on the west coast of Africa, in the region of the Gaboon; but information received in London from the authorities of the British Museum, and others, induced them to go instead to the delta of the Nile, where the party is now supposed to be.

In April and May, a successful trip to the lake region of Southern Wisconsin was taken by Professor Dean and Dr. Graf, in search of the early stages of the ganoid *Amia*. Interesting results were attained, and Dr. Graf is still in the field continuing the work begun by Professor Dean. Several students and two members of the staff were engaged in biological work at the marine station at Wood's Holl, Mass., in the summer of 1897, and during the present year four members of the staff, and a number of students, will pass the summer wholly, or in part, in field-work at that laboratory. Others will work at the marine laboratory at Cold Spring Harbor, L. I., on the coast of Maine, and in Labrador. Professors Osborn and Wilson expect to attend the International Congress of Zoölogy to be held in August at Cambridge, England, and will visit many of the European laboratories.

6. *General Statement and Recommendation.* — A large amount of time has been devoted throughout the year to the arrangement of the new zoölogical laboratories in the fourth floor of Schermerhorn Hall, all of which are now in effective working order. The teaching collections have been classified, labeled, and arranged, in the hallways into which the various laboratories open. The latter comprise one large laboratory for undergraduate work in zoölogy, histology, embryology, and anatomy, one for comparative neurology, one for advanced graduate class-work, and one for general investigation. In addition to these there are eight smaller rooms for private and special research, a well-arranged library, and separate rooms for aquaria, for preparation, and for storage of material. All these have proved to be admirably adapted for their purpose, and leave little to be desired as far as space, light, arrangement, and general furnishing are concerned. But, although the general equipment of the laboratories is now well advanced, many important

additions will be required to render it adequate to the work that is being attempted. The teaching collections are still very deficient in histological and embryological preparations, and are inadequately provided with anatomical preparations and models, which are greatly needed both in undergraduate and in graduate instruction. Among the most pressing needs are a projection-lantern, and a large additional series of charts for the lecture-room, and an outfit for photographic work. Less immediate, but not less important, is the need for additional microtomes of the most modern type, and other special apparatus used in graduate instruction and research. A relatively small outlay would suffice to supply these deficiencies and place the laboratory in a leading place of usefulness.

LIBRARY

REPORT OF THE LIBRARIAN

FOR THE ACADEMIC YEAR ENDING JUNE 30, 1898.

To the President of Columbia University
in the City of New York:

SIR:

I have the honor to make the following report for the library for the year ending June 30, 1898:

GROWTH OF LIBRARY

The number of volumes added during the year was 16,377, of which there were derived from purchase or exchange 9182 volumes, from gift 5636 volumes, and 1559 volumes from the binding of pamphlets and other works received in pamphlet form during the year or already in the library unbound. These additions bring the number of volumes in the library, exclusive of duplicates, to above 250,000. The number of volumes given during the year to the library, including duplicates not incorporated in the library, was 6163; the number of pamphlets given was 5666. Gifts of books and pamphlets were received from 909 persons or institutions. Many books and pamphlets received from Universities and other institutions, which receive in return the publications of Columbia, are here recorded as gifts, because the character of exchange is general and not specific.

A résumé of the additions to the library for the preceding five years stands as follows:

1892–1893	19,797
1893–1894	15,161
1894–1895	24,839
1895–1896	20,584
1896–1897	11,928

This shows an average annual increase for this period of 18,462 volumes, an average which is materially reduced from earlier averages, by reason of smaller additions during the fiscal year of 1896–1897. The additions, however, from the 1st of January, 1898, to June 30th, the last six months of the year, were 9840 volumes. The falling off of the normal growth of the library, by reason of its removal to its new site, which manifested itself in the additions of the previous year and the first half of this year, may be considered to have come to an end after the settlement in the new building had been fairly accomplished, so that for the second half of the year an increase fully up to the average growth of the library for a number of years past has been again attained. This growth was made possible by the gifts of money for the purchase of books which will be reported later in the proper place. As stated in last year's report, the regular appropriation from the General Treasury covers, substantially, only the necessary expenditures for subscriptions, serial publications and continued works, and for current binding and repairs. From the income of the Barnard Fund we have been able to buy all books recommended from the various scientific departments, and to add many important scientific series during the year. The income of the Avery and Cotheal Funds have been applied to the purposes for which they were created.

Perhaps the most interesting direction in which the library has been developed, during the past six months, has been from the gift designated as Special Fund for History, 1898; a gift of $5000 from President Low, of which about $4500 was devoted to the purchase of books on the history of the period of the Reformation and to the period of the French Revolution, an equal sum having been devoted to each section.

The library already contained much in both these fields, but for successful and satisfactory work, here as elsewhere in the domain of history, large additions supplementing what was already here were necessary. Some time ago a plan was formed between the Department of History and the Librarian, of developing the library in the field of German history, and for that purpose the scholarly and comprehensive bibliography of German history, known as Dahlmann-Waitz, *Quellenkunde der deutschen Geschichte*, was carefully checked up from our catalogue, showing which of the ten or twelve thousand volumes entered in that work were already in the library. An estimate was made of the probable cost of acquiring for the library all the works given in that bibliography which were not already here. When the above-mentioned fund was made available it was determined to apply a part of it to German history of the period of the Reformation, and substantially all the material cited in this bibliography for the period of German history running from the year 1450 to 1625, together with many collected works and historical publications covering a wider field, were ordered and have been in part received. This bibliography has been supplemented by many other titles in the field of German religious and political history for this period, so that when all are received a most excellent equipment for that section of history will be at hand. Professor J. H. Robinson, of the Department of History, has given much attention and labor to this undertaking.

In the same way the best available bibliographies for the period of the French Revolution and the First Empire, including the bibliography attached to Professor Sloane's Life of Napoleon, have been checked up, and a large body of orders selected or approved by Professor Sloane have been placed. The literature for this period is however so extensive that much will remain still to be done when, in the future, funds are available.

If the same course can be made possible in the future for other fields of history, and careful additions supplementing what the library now has, can be effected, an unrivaled body of material for historical study will, in a few years, be available. The titles of some important sets of books acquired during the year are here given:

Analectes pour l' histoire ecclesiastique de la Belgique, 25 vols.
Annali di Statistica d'Italia, 40 vols.
Archiv für die gesammte Naturlehre, 18 vols.
Archiv für die Geschichte des deutschen Buchhandels, 15 vols.
Archiv für hessische Geschichte, 18 vols.
Archives des sciences physiques et naturelles, 126 vols.
Archivio storico lombardo, 24 vols.
Archivio storico per le provincie Napoletane, 22 vols.
Atti della società italiana di scienze naturali, 34 vols.
Atti e memorie dell' Istituto Veneto, 162 vols.
Baltische Studien, 45 vols.
Copenhagen, Naturhistoriske Forening, Meddelser, 45 vols.
Geschichtsquellen der Provinz Sachsen, 35 vols.
Historisches Jahrbuch der Görres Gesellschaft, 12 vols.
Journal of the Academy of Natural Sciences in Philadelphia, 18 vols.
Journal of Education, 34 vols.
Massachusetts Teacher, 27 vols.
Pædagogium, 16 vols.
Patriotisches Archiv, 12 vols.
Recueil des travaux chimiques, 12 vols.
Revue de linguistique, 28 vols.
Revue socialiste, 25 vols.
Schweizerische Paläontologische Gesellschaft; Abhandlungen, 20 vols.
Société philomathique de Paris, Bulletin and other publications, 81 vols.
St. Gallen Naturwissenschaftliche Gesellschaft; Berichte, 30 vols.
Upsala, Societas scientiarum, Nova Acta, 21 vols.
Verein für Geschichte der Deutschen in Böhmen; Mittheilungen, 34 vols.
Zeitschrift der historischen Gesellschaft von Posen, 12 vols.
Zeitschrift des Harz-vereins für Geschichte, 30 vols.
Zeitschrift für die gesammten Naturwissenschaften, 67 vols.

USE OF LIBRARY

From the report of Mr. C. Alex. Nelson, Deputy Librarian, in charge of circulation, it appears that from October 12, 1897, when the library was opened for the circulation of books, until June 30th, the number of volumes loaned was 47,832, of which loans, renewals were made on 36,586. During the same time there were delivered to readers for use in the general reading-room 30,373 volumes. Continuing, the report says:

"These figures do not show the use made of the 10,000 volumes of reference books on the shelves of the main reading-room, to which readers have free access, and of current periodicals in the periodical room, nor are the books in daily use in the seminar rooms included. Fifty volumes per day on the average have also been used in the Avery Architectural Library.

"The general reading-room was opened to evening readers January 27th, they having been previously accommodated in the Law Library. The Avery room and seminar rooms have also been open evenings. An hourly count made of the readers present in each room shows that the average attendance of evening readers has been, for January, 34.5; February, 43; March, 56; April, 66.8; May, 66.34; June, 24.2. The largest number, 116 on May 11th; the smallest, 13 on June 18th. The Law Library has been closed at 6 P.M. since June 17th."

ORDER DEPARTMENT

Mr. T. W. Idle from the Order Department reports that during the year 5506 formal orders were sent out, of which 2289 have been filled, and 282 have been cancelled, because the items offered in a second-hand catalogue were already sold, or for other reasons. It should be stated that a large part of these orders have been placed during the past four months for European books, so that sufficient time has not yet passed to permit their being all filled.

THE CATALOGUE DEPARTMENT

The work of the Catalogue Department has been carried on during the year with little interruption, and in the usual careful manner. 45,687 new cards were written and placed in the catalogue over against a record of 44,861 for the previous college year. Of this number 30,318 have been made since January 1st. In addition, 29,683 old cards were corrected and brought up to date during the year.

An interesting experiment has been carried on since January 1st in the work of cataloguing. Arrangements were made by Columbia University Library, the New York Public Library, the John Crerar Library in Chicago, the Boston Public Library, and the Harvard University Library, to index the current numbers of a selected body of scientific periodicals and transactions of learned societies. Each library undertook to furnish the copy for the periodicals assigned to it, and the work of printing these entries on cards, to be used in the regular catalogues of the libraries, was placed in charge of the Publishing Section of the American Library Association, which likewise received subscriptions from other libraries for the whole or part of the cards thus made.

A preliminary list of 184 current publications was selected by the co-operating libraries, and the work was begun with the current volumes commencing January 1, 1898. The enterprise has met with much approval on the part of other libraries, and a considerable body of subscriptions has been received. For the period from January 1st to June 30th, 1273 titles were indexed and printed. Each of the co-operating libraries is charged a certain rate for each card received, and is allowed a rebate for each entry furnished as copy. The net cost to this library of the 2546 cards received was $6.99, or about one half more than the cost of the same number of blank cards. The number of subscriptions give warrant for the expectation that hereafter lower rates can be made.

THE LIBRARY COUNCIL

The membership of the Library Council remains the same as last year; three meetings only of the Council have been held during the year.

REMOVAL OF THE LIBRARY

By direction of the President, the library was closed to the public on June 12, 1897, for the purpose of making the necessary preparations for removal to the new site. Incidental to this work, a careful inventory of the shelves of the entire library was made to ascertain what books were missing. The result showed 1650 volumes unaccounted for, on records running back substantially to 1883. Some of these missing volumes came to light when the books were re-arranged in the new building, and another inventory, which is being made at the date of this report, will reveal more clearly how many volumes are actually lost.

It had been hoped to commence the moving of books by July 1st, or at the latest by July 15th, when it was expected that the new steel book-stacks in Rooms 301 and 306 in the library building would be ready. As it was necessary to use, in the new library building, wooden shelving from the old building for about 125,000 volumes, it had been planned to remove the books from these stacks at the outset, place them on the new steel shelves, take down the wooden shelving and set it up in its place in the new building, and then proceed to move the several sections of the library into their proper places. Unexpected delays in the completion of the steel stacks nullified this plan; and, after long waiting, a beginning of moving was made by packing the contents of these shelves in boxes, removing the bookcases, section by section as they were emptied, setting them up in the new building, and occupying them shelf by shelf as fast as they were to some degree in order.

The first lot of books was not sent until August 23d; and the work of moving and arranging the library was materially increased by this delay and by the conditions described above.

The process of removal was simple, and reduced itself chiefly to mechanical labor. The boxes used for removal by the other departments of the University were utilized in the library. The books were removed shelf by shelf and packed carefully in the boxes, each box being labelled with the call numbers of the first and the last book it contained, and with the number of the room to which it was to go in the new library, together with a running number of the box for convenience of the workmen handling it. The boxes, thus packed and numbered by a detachment of the library staff, were turned over to the men engaged in the work of removal, and were received from them by another detachment of the library staff in the new building. The boxes were unpacked in their regular order, the books placed on the shelves, and the boxes returned for further service. The books were then on the shelves, the contents of each box in proper relation to the books contained in the boxes preceding and following it, but within the limits of the three or four shelves included in each box there was naturally the greatest disorder, created by packing and unpacking. It next became necessary to arrange the books on the sections of the shelves carefully in their proper order. Another element of disorder was the necessity, frequently met, of removing books from the shelves in the new building, especially in the steel stacks, to enable the workmen to complete some details of construction.

The great majority of books were in their places on October 1st, but delay in completing the shelving in some sections of the building, particularly in the Avery Library, made it impossible to remove some classes of books until some weeks later. The Librarian's office was moved about September 15th. The catalogue was removed and placed in the new catalogue card cases during the week between October 4th and 9th, and on October 12th the library was opened for the delivery of books to be used outside of the building.

Duplicates which were kept in the old library building on the old site still remain there in large part to the present time, as the shelves where it is intended to store them have not yet been put in place in the new building.

THE NEW LIBRARY BUILDING

The important facts concerning the planning, erection, and equipment of the library building will undoubtedly be recorded elsewhere.

The first academic exercises of any kind in the new buildings was a Chapel service held in the general reading-room on the morning of October 4th, at the beginning of the college year. The general reading-room was open to readers about November 1st; the electric outfit was so far in order that it was possible to open the library in the evening for readers on November 15th. The Avery Library was delayed beyond some other parts of the building in its equipment with bookcases, tables, etc., and was practically opened to the public for the first time January 8th.

In spite of the fact that in the early part of the year there was much interruption and confusion arising from the presence of workmen of all kinds in various parts of the building, a condition which has prevailed in some degree throughout almost the entire year, the experience of the library staff in its work in the library, and as far as can be observed that of officers, students, and other readers, in the new building has been most pleasant and satisfactory.

In any important building planned for a specific purpose or a group of purposes, however carefully the general design may have been studied, or however much technical skill and forethought may have been given to details, there is always a question how it will stand the test of actual experience. That which on paper looks well and promises much, is not always found practically available. In the case of this library building, so much larger than the old building, and so unlike it in its ground plan and arrangement, new difficulties of administration and unforeseen problems in actual use were naturally to be expected by those who administered the library and served the readers, while the readers themselves were to be brought into unaccustomed conditions. It gives me great pleasure, after a year's experience, to be able to report that we have found the new building and its equipments excellently adapted to the purpose for which it was created. The beautiful structure, with its reading-rooms and workrooms amply lighted, its spacious dimensions, and its architectural beauty, calls forth the warmest expressions of admiration from those who visit it occasionally and from those who use it constantly. The principal drawback which has manifested itself in the use of the building, arises from the fact that a large part of it, at the present time, is necessarily used for purposes other than those of the library. It is to be expected that these alien uses, bringing into the building a large number of persons who do not visit it to use the library, will necessarily create, while such use continues, more or less noise and disturbance.

Particularly the upper floor, which is devoted entirely to purposes other than those of the library, and which contains many lecture-rooms and is, therefore, frequented during the term time by many students, has been found a source of noise, which has detracted, to some extent, from the quiet desirable in the reading-room. This evil, inevitable while these large lecture-rooms are occupied for academic purposes, has been in large part mitigated by swinging-doors in the corridors and by other devices to lessen the noise.

The new library in its accommodations to readers consists of a general reading-room, the law reading-room, the Avery Library, and eighteen special study rooms, which are likewise used by various professors in the faculties of Philosophy and Political Science for seminar purposes. The Law Library, by direction of the President, is now administered by a special librarian under direction of the Law Faculty. All the reading-rooms have been kept open until 11 P.M., from January 28th, up to Commencement. Mr. Nelson, Deputy Librarian, has been in charge of the reading-room during the day, and library assistants have been on duty there in the evening and in the special study rooms both day and evening. Mr. E. R. Smith, as custodian of the Avery Library, is on duty from 1 P.M. until the closing of the library, while one of the library staff is in attendance there during the morning hours.

Much delay has been met with in the telephonic connections in the library, and the pneumatic tubes and book lifts have thus far not been available. The library administration has been obliged to handle all books, including the delivery of books to readers, by means of pages. The books in Room 306, which now contains Philosophy, Education, Language, and Literature, together with Theology, are somewhat remote from the delivery desk, and some time is necessarily involved in sending an attendant to bring a book from that room. Most of the other apartments in which books are stored are convenient of access to the delivery desk, and delivery can be promptly effected. It may be also stated further, from the standpoint of the library administration, as far as it concerns the order, accession, and catalogue departments, that since we have been fairly established in the building we find that work can be carried on more successfully and expeditiously than in the old quarters. Ample space is now at hand for the accommodation of the library staff, and it has been for the past six months working to the best advantage.

REFERENCE LIBRARY

The general reading-room contains shelf-space for about 10,000 volumes intended to hold a reference library, and steps were taken two years or more ago beginning the creation of that reference library, but as it was planned to make this largely a library of important and available works duplicating the books in the general library, it has not, up to the present time, been possible to effect entirely its completion. From available funds, and in some cases from duplicate copies already in the library, and from other sources, the larger part of the proposed collection has been gathered and arranged on the shelves of the reading-room. Additions are constantly made to this selected body of books, and it has proved to be of very great service. The remaining space in the reading-room not yet taken up by the permanent reference library has been utilized for special reference books recommended for the work of the term by officers of instruction, and by sets of periodicals most in demand.

DEPARTMENTAL LIBRARIES

Among the plans for the development of the University in its new buildings was the enlargement of the departmental library system for the scientific departments, and for those other departments desiring such libraries. Such libraries have, therefore, been continued or established in accordance with the wishes of the various departments. The departmental libraries at present existing are as follows:

Name of Department.	No. of Volumes.	Location.
Architecture	970	608 Havemeyer Hall.
Chemistry	1830	307 Havemeyer Hall.
Geology	316	404 Schermerhorn Hall.
Greek	587	306 College Hall.
Latin	195	306 College Hall.
Mathematics	138	203 College Hall.
Mechanical Engineering	3	304 Engineering Building.
Mechanics	83	614 Fayerweather Hall.
Metallurgy	486	105 Havemeyer Hall.
Mineralogy	411	307 Schermerhorn Hall.
Music	203	313 West Hall.
Oriental Languages	34	405 West Hall.
Pathology	124	College of Physicians and Surgeons.
Psychology	84	406 Schermerhorn Hall.
Zoölogy	1953	616 Schermerhorn Hall.

The views of the officers of the several departments of the University vary widely as to the character and the extent, or the practicable desirability, of departmental libraries. To some extent the system is still in an experimental stage, and modifications of the policy and practice to be observed may be expected in the future.

The botanical library, partly in anticipation of its future destination in the Botanical Garden at Bronx Park, was placed in Schermerhorn Hall near the Department of Botany.

LIBRARY OF THE NEW YORK ACADEMY OF SCIENCES

The Library of the New York Academy of Sciences has been for many years housed in the library building of Columbia. After the removal of the University to its new site, the Academy was for some time in doubt as to what steps to take with its collection of books. In February last a new arrangement was entered into by the University and the New York Academy of Sciences, by which the books and pamphlets of the Academy are to be stored in Schermerhorn Hall. This agreement assures to the members of the University the right to use the books.

The University removed at its expense the books to the new site, and provided them with suitable shelving; it also binds itself to provide the room in which the books are stored, with necessary light and heat, and ordinary cleaning, while the Academy henceforth assumes the responsibility for the care and custody of the books without further charge to the University. By this agreement the University, in return for the expense of removing this collection to the new site, is set free from the cost of binding current additions and other charges, which under the old agreement it bore.

BULLETIN OF THE NEW YORK PUBLIC LIBRARY

Through the courtesy of Dr. J. S. Billings, Director of the New York Public Library, there have been published, from time to time, in the *Bulletin* issued by that Library, lists of sets of periodicals on different subjects contained in the Public Library and in the library of this University. Thus far, lists of the following subjects have been issued:

American History,
Anthropology,
Archæology,
Astronomy,
Botany,
Chemistry,
Gardening and Horticulture,
General Science,
Geography,
Geology,
Language and Philology,
Mathematics,
Meteorology,
Mineralogy,
Physics,
Zoölogy.

GIFTS

As is shown in the statement concerning the growth of the library on page 273, a still larger number than usual of miscellaneous gifts of both books and pamphlets have been received during the year. These individual givers form a most important factor in the development of the library.

The larger number of givers and the greater body of their gifts reported during the year arises from the fact that more than the usual effort has been put forward by correspondence and otherwise in soliciting gifts from individuals, and especially from institutions and officials.

The sum of $5000.00 was given by President Low for the purchase of books in history, and the sum of $7500.00 was received from the same anonymous friend of the University, who has previously in years 1894, 1895, and 1896 presented generous sums designated in our records as Special Funds. Mr. Samuel P. Avery continuing his customary beneficence has given for the purchase of books and for the binding of books in the Avery Library during the year, the sum of $2207.27, beside many interesting and valuable books.

From a sum of money given by Mr. Charles H. Senff, and in the hands of President Low, the President set apart $900.00 for the purchase of books in American history, which was designated The Senff Fund for History 1897.

At the meeting of the Trustees in March, announcement was made of the gift, by Mr. Joseph F. Loubat (Duc de Loubat), of the property Nos. 503–511 Broadway and 74–82 Mercer Street, valued at $1,100,000, subject to an annuity during his life; the property, or its proceeds, to be applied, after his death, to the endowment of a fund to be known as the Gaillard-Loubat Library Endowment Fund for the maintenance and increase of the library.

This magnificent foundation, endowing the University library with one of the largest gifts in the history of university education, seems to assure the means for the future development of a University library equal to the needs and work of this institution. This library has attained its present growth of over a quarter of a million volumes on comparatively small and occasional resources. While the generosity of friends of the University and the library have at times enabled it to purchase books with comparative freedom, on the whole in its book buying the library has usually been obliged to proceed with much conservatism and careful economy.

While the same methods should prevail in the future, a library with an assured income is in a situation to develop in a more systematic and orderly manner, and increased resources will permit the work to be carried on more rapidly and without interruption. This foundation has caused the liveliest satisfaction among all the friends of the University and its library.

EXPENDITURES

The direct expenditures of the library from the appropriations made by the Trustees have been as follows:

Salaries	$27,553.62
Supplies and Incidentals	1,500.00
Books and Binding	12,020.84

The Book Account was as follows:

Appropriation	$12,000.00	Expended for books and binding	$12,020.84
Balance carried over from last year to meet outstanding orders	663.47	Balance carried to next year's account for outstanding orders	908.64
Sales and lost books	67.76		
Fines	198.25		
	$12,929.48		$12,929.48

There was expended during the year from the

Special Fund 1894	$ 412.63
Special Fund 1895	358.14
Special Fund 1896	3,011.79
Special Fund 1898	1,663.52
Special Fund for History 1898	2,027.34
Senff Fund for History 1897	749.29
Senff Fund for Biology	46.58
Sociology Fund 1894	40.02
Adams Historical Fund	60.41
Barnard Fund	3,495.29
J. D. Crimmins Fund	23.36
Sampson Simpson Fund	112.00
John McKeon Fund	63.00
Cotheal Fund	205.20
Avery Fund	1,130.18

The Sociology Fund 1894, Special Fund 1894, Special Fund 1895, and the Adams Historical Fund are now entirely expended.

The expenditures for the binding and the repair of books in the general library were $4773.65, and there were bound for the Law Library 304 volumes at a cost of $159.95, making a total of $4933.60. Besides this, there were bound from the books bought some years ago from the Struve Library, 210 volumes at a cost of $186.54, which was paid from the proceeds of sales of duplicates from the Struve Library. The whole number of books newly bound was 6110, at a cost of $4277.78; 2103 volumes were rebound or repaired at a cost of $842.36. Class and book numbers were gilded on 13,664 volumes at a cost of $481.46. These statements do not include books bound for the Avery Library, largely at Mr. Avery's expense.

Appendices show the current use of the library and give the names of those persons and institutions who, during the year, gave to the library books or pamphlets.

Respectfully,
GEO. H. BAKER,
Librarian.

APPENDIX A

STATISTICS OF THE USE OF THE LIBRARY, 1897–1898

1897–1898	Days Open	Loans	Renewals	Total Loans	Daily Average	Largest Loaned	Smallest Loaned	Fines	Readers' Tickets Issued
July	Closed	—	—	—	—	—	—	—	—
August	"	—	—	—	—	—	—	—	—
September	"	—	—	—	—	—	—	—	—
October	17	2485	69	2554	150.0	207	86	$ 5.30	13
November	25	4164	992	5156	206.2	347	12	20.70	26
December	26	5081	6796	11,877	456.8	307	101	17.40	16
January	25	4936	3426	8362	334.4	294	10	30.45	21
February	24	5707	2149	7856	327.3	359	162	32.25	15
March	27	7206	2603	9809	363.3	388	199	25.20	20
April	25	7548	10,301	17,849	714.0	446	206	23.05	15
May	26	6644	2544	9188	353.4	393	44	27.00	10
June	26	4061	7706	11,767	452.5	314	14	16.90	16
TOTALS	221	47,832	36,586	84,418	382.0	—	—	$198.25	152

APPENDIX B

COLUMBIA UNIVERSITY LIBRARY

RECORD OF GIFTS, 1897–98

	Vols.	Pam.
Aberdeen Univ.	1	3
Adams, Edw. D.	10	28
Aguilar Free Lib'y		1
Alabama Adj.-Gen.	2	
" Attorney-Gen.	2	
" Auditor	5	
" Bar Assoc.	2	
" Geol. Survey	1	3
" Indust. Soc.		1
" R. R. Com.	7	
" Treas.		8
Albany High School		1
" P. E. Diocese		1
Alfred Univ.		1
Allen, Dr. H.		1
Alma College		1
American, The	1	7
Am. Bar Assoc.	1	1
" Church Bldg. Fund		4
" Humane Assoc.		3
" Inst. of Architects	1	
" Jewish Hist. Soc.	2	
" Meteorological Soc.	11	30
" Microscopical Soc.	1	
" Missionary Assoc.		1
" Museum of Nat. Hist.		1
" Numismatic Soc.	1	
" Philosophical Assoc.	2	
" Soc. Prevention of Cruelty to Animals		26
" Soc. of Civil Engineers	2	
" Soc. of Mechanical Engineers	1	
Amherst College		2
Andover Theol. Sem.		1
Arizona Adj.-Gen.		4
" Auditor		4
" Publ. Instr. Supt.	1	1
Arkansas Mines Bureau		2

	Vols.	Pam.
Arkansas Publ. Instr. Supt.	3	
" Sec. of State	4	
Associated Spanish and Cuban Press	1	
Assoc. of Colleges and Schools		7
Atherton, M. L.	1	1
Auburn Theol. Sem.		1
Avery, S. P.	168	
Baker, G. H.	67	
" W. G.	3	
Baldwin Univ.		1
Ball, Sir Robert		1
Baltimore Consol. Co Co.	1	
Basel Univ. Lib'y	43	38
Bates College		1
Batsford, B. T.		1
Bayles, Geo. Ja.	1	
Baylor Univ.	1	
Bebee, C. C.	1	
Behrens, E.	1	
Bellevue Hospital		5
Beloit College		1
Bennett, Mrs E. H.	1	
Berkeley School		2
Berlin Univ. Lib'y	39	122
Beth Israel Hospital		1
Blackburn Univ.		1
Bolton, H. C.		2
Boston Auditor	1	
" Children's Aid Soc.		10
" Children's Hospital		5
" Museum of Fine Arts		21
" Park Com.		1
" Poor Overseer		1
" Provident Assoc.		4
" Public Lib'y	3	
" Record Comm's	4	
" Transit Comm's	1	

	Vols.	Pam.
Boston Univ.		1
Bostonian Soc.		9
Bowdoin College		8
Brackett, H.		3
Breslau Univ. Lib'y	28	59
Bristow, W. B.	1	
British Columbia Agric. Dept.		2
British Columbia Mines Dept.	1	
British Columbia Trade Bd.		1
Britton, N. L.	7	
Brooklyn Chautauqua Union		1
" Eagle	1	1
" Eye and Ear Hospital		1
" Free Kindergarten		1
" Library		2
" Polytechnic Inst.		1
" Publ. Instr. Supt.	1	
" Teachers' Assoc.		1
" Y. M. C. A.		1
Brooks, Rev. W. H.	1	
Brown, J. N.	2	
Bryant, W. M.		1
Bryn Mawr Coll.	1	3
Buchtel Coll.		1
Buenos Aires Museo Nacional		4
Buffalo Charity Organ. Soc.		1
" Comptroller		4
" Historical Soc.		4
" Publ. Lib'y		3
" Soc. of Nat. Sciences		2
" University Club	1	
Bulkley, L. D.		1
Bunker Hill Monument Assoc.	4	
Burlington City Clerk	7	
Butler, N. M.	193	343
California Adj.-Gen.	5	
" Attorney-Gen.	1	
" Comptroller	4	
" Publ. Instr. Supt.		3
" Univ.	1	14
Cambridge Philosophical Soc.	1	
" School Supt.	5	19
Canada Agric. Dept.	1	
" Geol. Survey		1
" Mining Inst.	2	1
" Royal Soc.	1	
Canisius Coll.		1
Carnegie Lib'y		6
Carpenter, G. R.	10	18
" W. H.	30	60
Carruthers, G. T.	1	
Cattell, J. M.	77	465
Cayuga Lake Mil. Acad.		1
Centre College		1
Chandler, C.		1
Chapin, H. B.	1	
Cheeseman, T. M.	1	
Chicago Univ.	12	24
Chittenden, R. H.		1
Cincinnati Publ. Lib'y		1
" Soc. Nat. Hist.	2	1
" Univ.		4
Cleveland Publ. Lib'y		2
Colby Univ.		2
Cole, G. W.	1	
Coles, J. A.	1	
Colgate Univ.		2
College of the City of N. Y.		1
College Settlement Assoc.		7
Colorado Agric. Coll.		4
" Attorney Gen.	2	
" Auditor	1	
" College		1
" Fuel & Iron Co.		1
" Health Bd.	1	
" School of Mines		1
" Treas.	2	
Columbia University Bulletin		15
" Engineering Soc.	1	
" Observatory	32	133
Columbia Verse Editors	2	
Columbian Inst. for Deaf and Dumb		1
Columbus (Ga.) City Clerk	8	8

	Vols.	Pam.
Congregational Home Miss. Soc.		1
Conn. Agric. Bd.	6	
" Bank Commis.	2	
" Education Bd.		1
" Health Bd.	2	
" Insurance Com.	11	
" Labor Bur.	4	
" P. E. Diocese	1	
" R. R. Commis.	7	
" Treasurer	8	33
Cooper Union		16
Cornell Univ. Lib'y	7	19
Cottier, J. G. C., from the Parents of	86	
Coudert, F. R.		2
Crozer Theol. Sem.		1
Curry, J. L. M.	1	
Curtis, A.	1	
Cushing, H. A.	3	5
Custer, Mrs. E. B.		1
Cutler School		1
Da Costa, J. M.		1
Dartmouth Coll.		2
Day, A. P.		11
Delaware Adjt.-Gen.	4	
" Auditor	4	
" Const. Con.	1	
" Health Bd.	5	
" State Lib'y.	2	
" Treasurer	3	
Dellenbaugh, F. S.		1
Denison Univ.		1
Denver "		2
De Pauw "		2
Depew, C. M.		2
De Peyster, Gen. J. Watts	18	
Detroit Publ. Lib'y		1
Dewart, F. W.		1
District of Columbia Med. Soc.		1
District of Columbia Publ Sch. Com.		2
Doane College		1
Dorpat Univ.	12	11
Drew Theol. Sem.		1
Drexel Institute	1	1
Drisler, Henry	967	234
Drury College		1
Duluth Educ. Bd.		1
East Orange School Supt.		5
Eddy, H. T.		1
" Mary G. B.	1	
Edes, H. H.		1
Egleston, T.	101	
Emory College		1
Enoch Pratt Free Lib'y		1
Erlangen Univ. Lib'y	92	246
Eschbach, E. R.	1	
Essex Institute	1	1
Evangelical Alliance		1
Ex dono Amici Literarum	10	
Fairchild Bros. & Foster	1	
Fairmount Park Assoc.		1
Fauquier Inst.		1
Ferree, Barr		2
Field Columbian Museum		6
Fielde, A. M.	2	
Fisher, G.	1	
Fisk Univ.		2
Fitchburg City Clerk	1	
Fitz Publ. Lib'y.		1
Fletcher Free Lib'y		1
Florida Attorney-Gen.	1	3
" Publ. Inst. Supt.	7	1
" R. R. Com.	2	
" Treasurer	2	4
Flowers, H.		1
Forbes Library		1
Foster, Roger	1	
France, Min. Publ. Instr.	103	
Franklin and Marshall Coll.	1	2
Freiburg Univ. Lib'y	22	93
Furman Univ.		1
Gallant, A. E.		3
Garrett Biblical Inst.		1
Geddes, J., Jr.		1
Gennert, H.	26	
Georgetown College		11
Georgia Attorney-Gen.		5
" Geol. Survey	1	3
" School Com.	2	1
" Treasurer	13	
" Univ.		2
German, G. B.	8	12
Giessen Univ. Lib'y	23	47
Gilbert, H. L.		1
Girard College	1	
Gloucester City Clerk	1	
Goodhart, L. G.	44	
Göttingen Univ. Lib'y	20	89
Great Britain Geol. Survey	17	

	Vols.	Pam.
Great Britain Labor Bur.	1	
Green, S. A.	5	20
Greenwood, I. J.		11
Grosvenor Publ. Lib'y		3
Guernsey, R. S.	2	
Gustavus Adolphus Coll.		1
Guthrie, K. S.		3
Haliburton Club	1	
Halle Univ. Lib'y	37	76
Hamy, E. T.	1	
Harison, G. D. L.	1	
Hartford City Clerk	1	
" Hospital		1
" Theol. Sem.		2
Harvard Club of N. Y.	6	2
" Museum of Comp. Zoology		8
" Observatory	7	2
" University	2	
Hauptvogel, M.		1
Haverford College		3
Hayes, C. W.	1	
Hebrew Technical Inst.		1
Heckroth, G.	2	
Heidelberg (O.) Univ.		2
" Univ. Lib'y	40	90
Hennighausen, F. F.		1
Highley, F. M.	1	
Hiram College		1
Holland Soc.	1	
Howard Univ.		2
Hucke, J.	1	
Huntington, H.	1	
Idaho Attorney-Gen.	1	4
" Publ. Instr. Supt.	4	2
" Treasurer	4	2
Iles, G.	1	1
Illinois Adj.-Gen.	2	
" Attorney-Gen.	10	
" Auditor	6	1
" Equalization Bd.	20	
" Factory Inspector	4	2
" Fish Com.	5	
" Health Bd.	1	1
" Labor Bur.	3	
" Laboratory Nat. Hist.	1	
" Publ. Instr. Supt.	5	
" R. R. Com.	9	
" Sec. of St.	105	40

	Vols.	Pam.
Illinois Treasurer	2	
" Univ.	4	1
Indian Rights Assoc.		6
Indiana Acad. of Sci.	3	
" Adjutant-Gen.	8	
" Attorney-Gen.	6	
" Charities Bd.		26
" Geol. Survey	2	
" Health Bd.	9	3
" Labor Bur.	6	1
" Sec. of State	1	
" State Lib'y	12	1
" Treasurer	7	
Indianapolis Publ. Lib'y		1
Institution of Civil Eng.	3	2
Iowa Acad. of Science	1	
" Adj.-Gen.	10	4
" Agric. Coll.		3
" Auditor	16	
" Health Bd.	6	4
" Insurance Com.	8	
" Labor Bur.	3	
" Masonic Lib'y		1
" Publ. Instr. Supt.	5	3
" R. R. Com.	1	
" Treas.	5	10
" Univ.		10
Irish Nat. Federation of Am.		1
Irkutsk Zemstvo	1	10
Iron Age	2	
Iron and Steel Inst.	1	1
Italy, Min. of Agric.		4
Jackson, A. V. W.	2	
Jaeger Sanitary Woolen Co.	1	
James Blackstone Memorial Lib'y	1	
Japan Imp. Univ.	1	3
Jersey City Publ. Lib'y		5
John Crerar Lib'y		1
Johns Hopkins Univ.	13	16
" " Club		3
Johnston, W. P.	1	
Jordan, Mrs. M. C.	1	
Julien, A.	24	4
Kaluga Zemstvo	1	1
Kansas Acad. of Sci.	1	
" Attorney-Gen.	3	
" Bar Assoc.		1
" Hist. Soc.		2
" Insurance Com.	4	
" Labor Bur.	2	
" R. R. Com.	1	

	Vols.	Pam.
Kansas Treasurer	1	
“ University		14
Keidel, G. C.		2
Kekule, S.	4	
Kellogg, G. S.	2	
Kemp, R. C.		2
Kentucky Auditor	2	
“ Publ. Instr. Supt.	5	
“ R. R. Com.	9	
“ Treasurer		4
Kenyon Coll.		1
Keppler, E. A. C.	1	
King, J. A.	1	
Kingston Sch. of Mines		1
Königsberg Univ. Lib'y	8	45
Kuntze, O.		1
Lafayette College	3	24
Lake Forest Univ.		1
Lake Mohunk Indian Conf.		9
Lane Theol. Sem.		1
Langley, S. P.	1	
Langmann, G.	2	
La Plata Museum	21	11
Lawrence Publ. Lib'y		2
Lehigh Univ.		1
Leiden Univ.	15	11
Leipzig Univ. Lib'y	70	49
Leland Stanford, Jr., Univ.		5
Lemcke and Buechner	2	
Levasseur, E.	3	1
Liverpool Publ. Lib'y		1
London Labor Bur.		1
“ Royal Soc.	3	
“ Univ.	2	
Long Island Hist. Soc.	1	
“ “ P. E. Diocese		1
Los Angeles Publ. Lib'y		2
Loubat, Duc de	143	8
Louisiana Adj.-Gen.		3
“ Attorney-Gen.	3	
“ Educ. Com.		3
“ Sec. of State	2	
“ State Lib'y		6
Low, Seth, Pres.	185	235
Lowe, J. M.		1
Lowell City Lib'y		1
Loyola College		1
Lund Univ.	3	
Luttgen, F. W.	1	
Lyons Univ.	3	3
McDonald, G. G.		1
MacDowell, E. A.	45	
“ Mrs. C. E.	1	
McGill College		24
Mack, C. S.	1	
Maginnis, O. B.	4	
Magown, H. W.		1
Maine, Adj.-Gen.		15
“ Congregational Conf.		1
“ Genealogical Soc.		1
“ Health Bd.	1	
“ Labor Bur.	5	
“ R. R. Com.	1	
Manchester (N. H.) City Clerk	2	
“ Water Com.	1	
Marburg, T.	1	
Marburg Univ. Lib'y	21	59
Marcy, T. K.	1	
Marietta College		1
Maryland Comptroller	15	
“ Education Bd.		2
“ Geological Survey	1	
“ Insurance Com.	5	
Mass. Adj.-Gen.	10	
“ Agric. Coll.		6
“ Arbitration Bd.	4	
“ Attorney-Gen.	2	
“ Auditor	3	
“ Bank Com.	15	
“ Civil Service Com.	2	
“ Educ. Bd.	1	3
“ Gas and Elec. Light Com.	1	
“ Gen. Hospital		1
“ Health Bd	1	
“ Inst. of Technology		2
“ Insurance Com.	2	
“ Labor Bur.	1	
“ Prison Com.	15	5
“ P. E. Diocese		1
“ R. R. Com.	1	
“ Sec. of State	3	
“ St. Almshouse		1
“ St. Lib'y	3	
“ Tax Com.	4	
“ Treasurer		8
Master Car Builders' Assoc.	1	

	Vols.	Pam.
Matteawan Hospital		1
Matthews, B.	17	
Melbourne Univ.	1	
Mich. Adj.-Gen.	11	
" Agric. Bd.	2	2
" " Coll.	1	5
" Auditor	7	
" Bank Commis.	5	
" Charities Bd.		1
" Health Bd.	1	1
" Horticultural Soc.	3	
" Insurance Com.	6	
" Labor Bur.	3	
" Publ. Instr. Supt.	2	3
" R. R. Com.	1	
" Sec. of State	13	2
" St. Lib'y	20	
" Treasurer	10	
" University		4
Middlebury Coll.		1
Miller, G. A.	1	
Milwaukee Publ. Lib'y		4
" " Museum		1
Minn. Auditor	1	
" Health Bd.	9	6
" Hist. Soc.	3	
" Publ. Instr. Supt.	2	
" R. R. Com.	7	
" Sec. of State	1	
Miss. Attorney-Gen.		1
" Auditor	3	
" R. R. Com.	1	
" Treas.	2	2
Missouri Auditor	1	
" Botanical Garden	2	
" Health Bd.		1
" Insurance Com.	6	
" Labor Bur.	1	
" Publ. Instr. Supt.	4	
" R. R. Com.	2	
" Univ.		1
Mitchell, J. M.	2	
Montana Attorney-Gen.		1
" Equalization Bd.		1
" Labor Com.	5	
" Publ. Instr. Supt.		1
" State Coll.		1
Montet, F.	1	2
Morgan, J. L. R.	2	
Morison, G. S.	6	
Mower, E.	1	
Mowry, A.		1
Muhlenberg Coll.		1
National Assoc. Wool Mf'g.	1	1
" Conf. Unitarian Ch.		1
" Congress of Mothers		1
" Convention R. R. Com.	3	
" Educ. Assoc.	1	1
" Sculpture Soc.		1
Navy Records Soc.	1	
Nebraska Adj.-Gen.	3	4
" Labor Com.	2	
" Publ. Instr. Supt.		1
" Sec. of State	4	
" State Lib'y	4	
" Transportation Bd.	5	
" Univ.	5	
Nelson, C. A.	53	116
Nevada Adj.-Gen.		7
" Publ. Instr. Supt.		7
" Treasurer		1
New Brunswick Educ. Bd.	1	
New England Assoc. of Coll.		10
New Hampshire Health Bd.	9	
" " Insur. Com.	1	
" " Publ. Instr. Supt.	7	1
" " R. R. Com.	3	
New Jersey Adj.-Gen.	1	11
" " Assessors	6	3
" " Bank Com.	1	
" " Document Clerk	23	
" " Educ. Bd.	6	
" " Factory Insp.	1	9
" " Geol. Survey	3	
" " Health Bd.	6	
" " Hist. Soc.		7
" " P. E. Diocese		1
" " Quartermaster-Gen.	9	2
" " St. Microscop'l Soc.		1
" " Treasurer.	1	
New Mexico Auditor		3

	Vols.	Pam.
New Mexico Publ. Instr. Supt.		1
" " Sec. of St.	1	
" " Treas.		2
New So. Wales Roy. Soc.	1	
N.Y. City Architectural League	6	
" Bar Assoc.	1	
" Charity Organ. Soc.	2	2
" Children's Aid Soc.	1	3
" Comptroller	2	
" Docks Dept.	2	
' Engineers' Club	1	
" Fire Dept.	10	15
Lying-in Hospital		1
" Magistrates Bd.	1	
" Mayor	7	
" Mechanics' Lib'y		1
" Presbyterian Hospital		18
" Publ. Works Com.	3	
" St. Nicholas Soc.	1	
" Union Club	1	
" United Hebrew Charities		1
" Y. M. C. A.		1
" Y. W. C. A.		2
N. Y. St. Adj.-Gen.	7	
" Attorney-Gen.	4	
" Banking Dept.	10	14
" Chamber of Com.	1	
" Charities Aid Assoc.		7
" Charities Bd.	5	
" Civil Service Com.	1	
" Colonization Soc.		1
" Controller	2	
" Estimate and App. Bd.	3	
N. Y. St. Factory Inspect.	1	
" Health Bd.	4	
" Insurance Com.	1	
" Labor Bur.	1	
" Legislature	75	
" Library	6	10
" Lunacy Com.	1	
" Mediation and Arb. Bd.	5	
" Museum	1	
" Prison Com.	5	
" Public Instr. Supt.	2	
" R. R. Com.	6	
" Reformatory	1	
" Sec. of St.	1	
" Sons of the Revolution	1	
" Treas.	2	
" Univ.	15	11
" Women's Hospital		1
N. Y. Acad. of Sciences	1	5
" Assoc. for Improv. the Condition of the Poor		16
" Catholic Club	1	
" Com. of Statutory Revision	5	
" Farmer		1
" Free Lib'y		9
" Hist. Soc.	1	
" Hospital Sat. and Sun. Assoc.		1
" House of Industry		1
" Inst. for Blind		2
" " " Deaf and Dumb		4
" Juvenile Asylum		19
" Metropolitan Museum		1
" Pathological Soc.	1	
" Produce Exch'ge	1	
" P. E. Diocese		1
" Public Lib'y		10
" Sheltering Arms		1
" Society Lib'y		1
" Soc. for Prevention of Cruelty to Children		2

	Vols.	Pam.
N. Y. Soc. for Supp. of Vice		1
" " Order of Founders of Am.		1
" Yacht Club		1
" Zoölogical Soc.		1
Newark Publ. Lib'y		3
" St. Michael's Hospital		1
Newberry Lib'y		2
Newton Free Lib'y		1
Newton, R. C.		2
Nicholas, B.	1	
Nizhni-Novgorod	13	
No. Car. Agric. Ex. Station	6	
" Auditor	4	
" Health Bd.	6	12
" Labor Bur.	2	
" R. R. Com.	6	
" Univ.	1	4
No. Central Assoc. of Coll.		3
No. Dakota Attorney-Gen.	3	
" Auditor	1	
" Health Bd.		1
" Labor Bur.	1	
" Publ. Instr. Supt.	3	
" R. R. Com.	8	
Northampton City Clerk	9	
Northwestern Univ.		3
Norton, C.	2	
Notre Dame Univ.		2
Nova Scotia Inst. Nat. Sci.		2
" Mining Soc.		32
" Publ. Works Com.		16
Ohio Attorney-Gen.	6	
" Bar Assoc.	14	
" Charities Bd.		6
" Factory Insp.	1	1
" Fish Com.		4
" Health Bd.	9	1
" Insurance Com.	2	2
" Labor Bur.	1	1
" R. R. Com.	1	
" School Com.	7	
" Sec. of St.	1	
" St. Lib'y	1	1
" Treas.	4	6
Ohio Univ.		1
Oklahoma Health Bd.	1	4
" Publ. Instr. Supt.		6
O'Leary, C. M.		2
Ontario Agric. Dept.		9
" Live Stock Assoc.		1
" Mines Bur.		2
" Publ. Instr. Min.	2	
Ordronaux, J.	27	
Oregon Adj.-Gen.	2	1
" Publ. Instr. Supt.	1	1
" Sec. of St.	2	
" Treas.	2	
Osborn, H. F.	17	
Osgood, H. L.	2	
Pacific Univ.		1
Palmer, Mrs. C. F.	1	
Palmer, V.		1
Park College Lib'y		1
Parkman Club		7
Peabody Museum		5
Peck, E.		1
Pellew, C. E.	1	
Penn. Fish Com.	1	
" Insurance Com.	1	
" Internal Affairs Dept.	6	
" Lunacy Com.	3	
" Soldiers' Orph. Schools	4	
" St. College	3	20
" St. Lib'y	23	3
" Univ.	4	20
Peoria Publ. Lib'y		1
Perry, W. S.		3
Phelps, E. B.		1
Philadelphia City Inst.		1
" City Trusts	1	
" Controller	1	
" Free Lib'y		1
" Mercantile Lib'y		2
" Museum		1
" Union League Club	1	
Philips, G. M.		1
Plainfield Educ. Bd.		1
Planten, J. R.	6	9
Pollock, H. M.		1

	Vols.	Pam.
Poulton, E. B.	1	1
Pratt, F. S. and C. H.	1	
Pratt Inst.		14
Princeton Univ.	1	6
P. E. Miss'y Soc.		1
Providence Athenæum		2
“ Auditor	1	26
“ Publ. Lib'y		12
Purdue Univ.		9
Queens Coll.	1	
Queensland Auditor		16
“ Museum		3
“ R. R. Com.	3	
Randolph, L.	1	
Randolph-Macon Coll.		1
Redwood Lib'y		1
Rees, J. K.	30	293
Reynolds Lib'y	1	1
Rhode Island Adj.-Gen.	1	
“ Charities B'd.		12
“ Insur. Com.	14	
“ Labor Bur.	1	
“ R. R. Com.	7	
“ School Com.	6	2
“ Treas.	5	9
Ripon College		1
Roanoke College		2
Roberts, I.	1	
Robinson, J. H.	17	
Rochester Univ.		1
Rose Polytechnic Inst.		1
Rosenberg, Leo von		2
Runk, E. J.	1	1
Sächs. Statistis. Bur.	2	1
St. Francis Xavier Coll.	1	
St. Louis City Clerk	1	
“ Mayor	1	
“ Mercantile Lib'y		1
“ Publ. Lib'y.	2	1
“ Publ. School Supt.	14	
“ Trade and Commerce.	1	
St. Luke's Hospital		3
St. Mary's Free Hospital		1
St. Petersburg Univ.	5	13
St. Xavier Coll.		1
Santa Clara Coll.		1
Schneider, A.	1	
Schurman, J. G.	1	
Scranton Publ. Lib'y		1
Seler, E.	1	
Seligman, E. R. A.	223	135
Sellers, E. J.	1	
Settna, F. H. B.	1	
Shearman, T. G.	136	125
Shrady, Dr. J.	2	
Smith, E. M.	2	
Smithsonian Inst.	10	8
Society of the N. Y. Hospital		2
“ St. Johnland		1
Somerville City Clerk	1	
Sound Currency	4	5
So. Car. Educ. Bd.		3
“ Health Bd.		5
“ R. R. Com.	9	
So. Dakota Auditor	4	
“ Publ. Instr. Supt.	3	
“ Treas.	1	3
Speed, J. G.	1	
Speyers, C. L.	1	
Springfield Publ. Lib'y		3
Squires, Grant	2	
Staples, F.		6
Stevens Inst. of Tech.		1
Stevenson, J. J.		1
Stewart, W. R.	1	
Stockholm Univ. Lib'y	1	
Stoeckel, C.	1	
Stokes, O. E. P.	6	
Strassburg Univ. Lib'y	31	73
Sturgis, R.	18	
Swarthmore Coll.		2
Sydney Univ.	2	
Syracuse Central Lib'y.		1
“ Educ. Bd.		8
“ Univ.		3
Tauris Zemstvo	1	
Taylor, C. F.	7	34
Teachers Coll.		5
Technograph, The		6
Temple Pub. Co.		1
Tenn. Comptroller	1	
“ Univ.		3
Texas Comptroller		5
“ Hist. Soc.		5
“ R. R. Com.	4	
Thomas, C.	3	
Thurston, L. A.		3
Tillinghast, C. B.		1
Toronto Publ. Lib'y		1
“ Trinity Univ.	1	
“ Univ.	2	1
Torrey Club	16	

	Vols.	Pam.
Trenton Educ. Bd.	4	2
Trinity Univ.	1	
Tubingen Univ.	2	3
Tufts Coll.		2
Tulane Univ.		1
Underwood, L. M.	16	
Union College	1	
" Theol. Sem.		1
" Univ.		1
United Kingdom Geol. Soc.	10	17
U. S. Agric. Dept.	16	120
" Am. Republics Bur.	10	10
" Congress	173	
" Educ. Bur.	12	3
" Fish Com.	2	
" Geol. Survey	16	34
" Immigration Com.	5	7
" Infantry School		3
" Interior Dept.	23	25
" Interstate Com. Com.	7	
" Labor Bur.	3	10
" Military Order of Foreign Wars	1	
" Military Service Inst.	1	
" National Museum	4	
" Patent Office	7	
" R. R. Com.	2	11
" St. Dept.	13	3
" Supt. of Doc.	350	27
" Surgeon-Gen. Office	2	
" Treas. Dept.	5	25
" War Dept.	20	3
University Club		1
" of the South		1
" Settlement Soc.		1
Upsala Univ. Lib'y	104	118
Utah Attorney-Gen.		1
" Health Bd.		4
" Publ. Instr. Supt.		6
" Univ.		2
Utrecht "	27	13
Van Amringe, J. H.	1	13
Van Ingen, P.	17	
Vandegrift, F. B.		1
Vanderbilt Univ.		1
Varona, I. M. de	1	
Vassar Coll.		1
Vermont Agric. Ex. Station		3
" Auditor	1	
" St. Lib'y	33	8
" Treas.	1	
" Univ.		1
Victoria Mines Dept.		1
" (B. C.) Lib'y	1	5
" (Can.) Univ. Lib'y	2	
Virginia Auditor	4	
" Univ.	1	3
Vodges, A. W.	2	
Volta Bureau		1
Wabash Coll.		1
Wagner Free Inst. of Sci.		2
Wallace-Neil, E.	2	
Ware, W.	3	
Washington City Free Lib'y		1
" St. Pub. Instr. Supt.	1	1
" St. Treas.	3	
" Univ.		1
Webb, W. H.	2	
Wellesley Coll.		1
Wesleyan Univ.		10
West, M.		2
West Va. Auditor	1	
" Treas.	1	
Western Reserve Univ.		1
Westrup, A. B.		2
Wheeler, H. L.	1	
Whipple, G. C.	2	
Whitman Coll.		2
Wigan Publ. Lib'y		2
Willard St. Hospital		1
Willcox, H.	1	
William and Mary Coll.		1
Williams Coll.		15
Winthrop, R. C., Jr.	1	
Wisconsin Educ. Com.	1	3
" Free Lib'y		1
" Health Bd.		3
" Hist. Soc.	1	
" Insur. Com.	2	
" R. R. Com.	5	
" St. Bd. of Control	4	1
" Treas.	1	32
" Univ. Lib'y	1	6
Wittenberg Coll.		10

	Vols.	Pam.		Vols.	Pam.
Woodbury, J. P.	1		Wyoming Univ.		7
Worcester Publ. Lib'y.		1	Yale Univ.	2	6
Würzburg Univ. Lib'y.	3	4	Yorkshire Coll.	1	1
Wyoming Charities Bd.		1	Youth's Companion	1	
“ Equalization Bd		1	Giver Unknown	175	
“ Publ. Instr. Supt.	1	2			
“ Sec. of State.		10		6163	5666
“ Treas.		9			

TREASURER'S STATEMENT OF EDUCATIONAL RECEIPTS AND DISBURSEMENTS FOR THE YEAR ENDING JUNE 30, 1898

RECEIPTS

Receipts from—		
Rents		$384,877 76
Fees :		
Matriculation Fees	$ 4,080 00	
Tuition Fees	326,199 40	
Diploma Fees	10,937 00	
		341,216 40
Students :		
For Breakage, Supplies, and Material		10,070 42

RECEIPTS FROM INCOME AND ACCUMULATIONS OF INVESTED FUNDS HELD FOR SPECIAL PURPOSES

Robert Center Fund, net	$3,067 55	
Gebhard Fund	800 00	
Charles M. DaCosta Fund	4,900 00	
Moffat Scholarship Fund	90 00	
Schermerhorn Scholarship Fund	225 00	
Stuart Scholarship Fund	270 00	
Hazlett Mortgage (interest)	1,725 00	
		11,077 55
Carried forward		$747,242 13

Brought forward.............		$747,242 13

RECEIPTS FROM SUNDRY SOURCES FOR DESIGNATED PURPOSES

Library. (Fines and Sales.)....	$266 01	
Architecture, for Salaries. (Gift.)	2,500 00	
Civil Engineering. (Tests.)....	104 43	
Chemistry, for Supplies. (Gift.)	7,257 37	
Mining, for Departmental Appropriation, including Summer Class. (Sales.)..............	6 26	
Mathematics, for Salaries. (From Barnard College.)............	3,500 00	
Oriental Languages, for Salaries. (Gift.)......................	750 00	
Political Science, for Salaries. (Barnard College.)...........	9,500 00	
Political Science, for Departmental Appropriation. (Sales.)	14 26	
Educational Administration, for Catalogues. (Sales.)..........	101 00	
Educational Administration, for Lectures. (Gift.)............	250 00	
		24,249 33
Deficiency in Income for Current Expenses.....		32,164 34
		$803,655 80

CURRENT EXPENSES

ITEMS PROVIDED OUT OF THE GENERAL FUNDS OF THE CORPORATION

I. General Expenses.		
Business Administration	$16,710 16	
Educational Administration	68,209 87	
Buildings and Grounds	77,979 11	
Gymnasium	2,000 00	
Chapel	2,046 50	
Library	45,074 46	
Emeritus Officers	6,400 00	
Fellowships, Scholarships, and Prizes	19,410 97	$237,831 07
II. Philosophy, Philology, and Letters.		
English Departments	$26,682 73	
Germanic Languages and Literatures	11,649 04	
Greek	11,550 00	
Latin	9,840 38	
Music	5,996 30	
Oriental Languages	8,349 22	
Philosophy and Education	9,750 00	
Psychology	5,999 96	
Romance Languages and Literatures	15,636 50	105,454 13
III. Natural and Exact Sciences.		
Architecture	$26,200 00	
Astronomy	10,246 11	
Botany	5,790 41	
Chemistry	53,160 30	
Engineering Departments	34,774 17	
Geology and Palæontology	9,800 00	
Mathematics	18,016 05	
Mechanics	12,738 43	
Mineralogy	5,499 97	
Metallurgy	7,499 90	
Mining	10,522 69	
Physical Anthropology	1,500 00	
Physics	19,699 21	
Zoölogy	15,099 28	230,546 52
Carried forward		$573,831 72

Brought forward		$573,831 72
IV. School of Law		35,280 67
V. School of Political Science		62,228 55
VI. School of Medicine:		
Anatomy	$22,119 52	
Clinical Instruction	11,600 00	
Materia Medica and Therapeutics	7,525 09	
Obstetrics and Gynecology	12,232 40	
Pathology	30,955 43	
Physiology	13,256 22	
Practice of Medicine	13,550 00	
Surgery	13,449 81	
Physiological Chemistry (Organization)	1,014 59	
		125,703 06

INTEREST PAID

On account of extensions at the College of Physicians and Surgeons	$6,525 00	
On account of Philolexian Prize Fund	86 80	
		6,611 80
		$803,655 80

OTHER OUTLAYS PROVIDED FOR BY THE INCOME AND ACCUMULATIONS OF INVESTED FUNDS FOR SPECIAL PURPOSES

I.—Library, for Purchase of Books:		
Barnard Library Fund.......	$3,495 29	
Avery Architectural Collection	3,380 68	
Samson Simson Fund........	112 00	
John McKeon Fund.........	63 00	
Cotheal Fund...............	205 20	
Drisler Classical Fund.......	391 05	
		$7,647 22
II.—Fellowships, Scholarships, and Prizes:		
McKim Fellowship..........	2,000 00	
Barnard Fellowship...........	450 00	
Trowbridge Fellowship.......	500 00	
Chanler Historical Prize......	45 00	
Loubat Prizes	1,401 10	
Pulitzer Scholarships.........	2,475 45	
Bennett Prize...............	40 00	
J. M. Smith Prize, School of Medicine................	100 00	
Stevens Prize, School of Medicine......................	200 00	
Alonzo Clark Scholarship, School of Medicine........	670 00	
Harsen Prizes for Clinical Reports, School of Medicine...	250 00	
Harsen Examination Prizes, School of Medicine........	1,314 00	
		9,445 55
III.—Sloane Maternity Hospital:		
Income of Trust Funds......		12,500 00
IV.—Vanderbilt Clinic:		
Income of Trust Funds		5,650 00
		$35,242 77

OTHER OUTLAYS PROVIDED FOR BY RECEIPTS FOR DESIGNATED PURPOSES

I.—Library:		
John D. Crimmins Collection	$ 23 36	
Senff Collection in History	749 29	
Senff Collection in Biology	46 58	
Books in Sociology	161 95	
Adams Historical Collection	60 41	
Special Fund 1894	282 37	
Special Fund 1895	358 14	
Special Fund 1896	3,011 79	
Special Fund 1898	1,663 52	
Special Fund in History 1898	2,027 34	
		$8,384 75
II.—Fellowships, Scholarships, and Prizes:		
Annual Fellowships	625 00	
Antioch College Fellowship	34 76	
Toppan Prize in Municipal Law	150 00	
Alumni Fellowship, School of Medicine	1,500 00	
		2,309 76
III.—Engineering Departments:		
Civil Engineering, to replace Instruments destroyed by fire, July 18, 1896	2,011 21	
Mechanical Engineering, for Special Equipment	994 14	
		3,005 35
IV.—Department of Mining:		
Special Equipment of Laboratory		1,098 45
V.—Department of Zoölogy:		
Marine Table at Naples	250 00	
Senff Expedition to Africa	2,000 00	
		2,250 00
		$17,048 31

RECEIPTS FOR PERMANENT PURPOSES

Seth Low	$125,000 00	
Fayerweather Legacy	100,000 00	
William C. Schermerhorn	50,000 00	
One Hundred and Twentieth Street Gate. (Gift of Class of '82.)	1,500 00	
Schiff Fellowship Fund. (Gift of Mr. Jacob H. Schiff)	15,000 00	
Joseph Mosenthal Fellowship Fund (Gift of the Joseph Mosenthal Fund Committee)	7,500 00	
Charles B. Beck Fund. (Legacy from Charles B. Beck, deceased.)	2,500 00	
William P. Trowbridge Fellowship Fund. (From Mr. D. LeRoy Dresser, Treasurer, to complete Fund.)	1,000 00	
		$302,500 00

MORNINGSIDE HEIGHTS

TOTAL COST, WITH INITIAL IMPROVEMENTS

Library Building :			
Construction................		$1,100,542 09	
Equipment		97,037 38	
			$1,197,579 47
Schermerhorn Hall :			
Construction................		457,658 17	
Equipment		35,786 35	
			493,444 52
Fayerweather Hall :			
Construction................		274,113 67	
Equipment		14,645 43	
			288,759 10
Havemeyer Hall :			
Construction................		516,488 62	
Equipment		53,474 86	
			569,963 48
Engineering Building :			
Construction................		284,075 50	
Equipment		20,325 47	
			304,400 97
University Hall :			
Construction................		842,887 85	
Equipment :			
Power House...	$115,578 52		
Gymnasium....	39,399 24		
		154,977 76	
			997,865 61
Carried forward.........			$3,852,013 15

Brought forward		$3,852,013 15
Vaults:		
East	$30,382 79	
West	37,316 40	
		67,699 19
Repairs and Equipment of Old Buildings:		
West Building	10,252 67	
College Hall	5,113 34	
		15,366 01
Outside Street Work		107,140 39
* Improvement of Grounds and Incidentals		429,601 17
Expenses of Removal		59,987 56
Purchase of Land		2,000,000 00
Interest		339,812 08
Insurance		3,754 40
Legal Expenses		3,637 95
Total cost		$6,879,011 90

CREDITS

Sale of old brick	$ 6,019 47	
Award for widening One Hundred and Twentieth Street	922 50	
Rents received from Old Buildings.	4,510 00	
Interest on Deposits of the Building Fund	11,332 68	
Interest on Deposits of the Schermerhorn Building Fund	115 00	
		$22,899 65
Cost on Treasurer's Books		$6,856,112 25

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* "Improvement of Grounds and Incidentals" embraces these items: South Court, grading, paving, retaining walls, steps, etc., $123,000; grading, paving, and draining within the grounds, $57,000; transverse roadway with coal-storage vaults and sewer and interior tunnels connecting all the buildings, $79,573; retaining wall where the grade breaks, $15,921.38; architects' and engineers' commissions, $23,714.33; incidentals, about $100,000, of which $23,000 is reserved to meet unforeseen expenses that may or may not be incurred.

SCHEDULE OF TRUST FUNDS

Avery Architectural Library Fund :		
$15,000 Lehigh Valley Railroad Co.'s Guaranteed 4 per cent. First Mortgage Bonds.	$15,000 00	
Cash	10,000 00	
		$25,000 00
James Gordon Bennett Prize Fund :		
$1,000 West Shore Railroad Co.'s Guaranteed 4 per cent. First Mortgage Bonds, due 2361 at 102⅞		$1,028 75
Barnard Library Fund :		
Bond and Mortgage on property Nos. 719 and 721 Ninth Street, New York, at 6 per cent. (reduced to 5 per cent.) due July 16, 1883	$7,500 00	
$11,000 Buffalo, Rochester, and Pittsburg Railroad Co.'s 5 per cent. General Mortgage Gold Bonds due September 1, 1937	10,960 57	
$24,000 Illinois Central Railroad Co.'s 4 per cent. Bonds of 1933. Cost $22,550, and one month and four days' interest at 4 per cent., $90.67.	22,650 67	
Eight Coupon Bonds, Series "B," Pitkin County, Colorado, Funding Bonds at 6 per cent., each $500	4,000 00	
Two Mortgage Deeds on property at Litchfield, Conn., and Two Promissory Notes, one for $3,500 at 5 per cent., and one for $500 at 6 per cent	4,000 00	
Cash	12,974 97	
		$62,086 21

Barnard Fellowship Fund :		
Cash		$10,000 00
Margaret Barnard Fund :		
Cash		$15,889 41
Chanler Prize Fund :		
$1,000 St. Paul, Minneapolis and Manitoba Railroad Co.'s 4½ per cent. Consolidated Mortgage Bonds, due 1933		$1,000 00
Columbia Fellowship Fund :		
$13,000 Lehigh Valley Railroad Co.'s 4½ per cent. First Mortgage Bonds, due 1940		$13,000 00
Alexander I. Cotheal Fund :		
Bond and Mortgage on property No. 437 East 86th Street, New York, at 4½ per cent., due June 19, 1901		$6,000 00
Robert Center Fund :		
$4,000 Belleville and Carondelet Railroad Co.'s 6 per cent. First Mortgage Bonds, due June 1, 1923, at 114, and interest for 21 days	$4,574 00	
$6,000 Georgia Pacific Railroad Co.'s 6 per cent. First Mortgage Bonds	6,885 00	
Ten Shares Edison Electric Illuminating Co. of New York	1,000 00	
Bond and Mortgage on property No. 436 East Eighty-seventh Street, New York, at 5 per cent.	5,000 00	
Bond and Mortgage on property on Douglas Street and Utica Avenue, Brooklyn, at 5 per cent.	3,000 00	
		$20,459 00

Malbone Street, south side, northwest of Rogers Avenue, running through to Sterling Street (unopened) 400 by 200, partly covered by water, about 17 lots, Brooklyn, N. Y....................		
Nos. 320 to 334 Flatbush Avenue, Brooklyn, N. Y....		
Two Hundred Shares American Cotton Oil Co.'s Common Stock................		
One Hundred Shares General Electric Co...............		
One Hundred Shares Edison Electric Illuminating Co. of New York.............		
Charles M. Da Costa Professorship Fund :		
$20,000 Central Railroad of New Jersey 5 per cent. Consolidated Mortgage Bonds..	$20,000 00	
$25,000 New Jersey Junction Railroad Co.'s 4 per cent. First Mortgage Guarantee Bonds.....................	25,000 00	
$10,000 Lehigh Valley Terminal Railroad Co.'s 5 per cent. First Mortgage Gold Bonds....................	10,000 00	
$20,000 Pittsburg, Chicago, Cincinnati, and St. Louis Railroad Co.'s 4½ per cent. Bonds....................	20,167 50	
$25,000 New York, Lake Erie, and Western Railroad Co.'s 6 per cent. First Mortgage Bonds........	25,000 00	
		$100,167 50

Joseph F. Loubat Fund :		
$7,000 Buffalo, Rochester, and Pittsburg Railroad Co.'s 5 per cent. General Mortgage Bonds	$6,979 75	
Cash deposited with the New York Life Insurance and Trust Co. at 3 per cent	20 25	
		$7,000 00
Joseph F. Loubat Prize Fund :		
Cash deposited in the New York Life Insurance and Trust Co		$2,060 26
McKim Fellowship Fund :		
$20,000 St. Paul and Manitoba Railroad Co.'s 4½ per cent. Consolidated Mortgage Bonds		$20,000 00
Drisler Classical Fund :		
Cash		$10,000 00
William C. Illig Fund :		
Cash		$2,000 00
John McKeon Fund :		
Cash		$1,000 00
Member of Class of '85 Fund :		
Cash		$1,050 00
Moffat Scholarship Fund :		
St. Paul, Minneapolis, and Manitoba Railroad Co.'s 4½ per cent. Consolidated Mortgage Bonds, due 1933		$2,000 00
Philolexian Prize Fund :		
Cash		$1,240 00

Joseph Pulitzer Fund:		
$25,000 Niagara Falls Power Co.'s First Mortgage 5 per cent. Bonds at 90 flat......	$22,500 00	
$29,000 Manhattan Elevated Railroad Co.'s 4 per cent. Consolidated Bonds at 96⅜, including commission......	27,948 75	
Cash	49,551 25	
		$100,000 00
Schermerhorn Scholarship Fund:		
St. Paul, Minneapolis, and Manitoba Railroad Co.'s 4½ per cent. Consolidated Mortgage Bonds, due 1933......		$5,000 00
Samson Simson Fund:		
Cash		$1,000 00
Stuart Scholarship Fund:		
Cash		$6,000 00
Students' Loan Fund:		
Cash Deposited with the New York Life Insurance and Trust Co., at 3 per cent....		$5,000 00
Tyndall Fellowship Fund:		
West Shore Railroad Co.'s Guaranteed 4 per cent. First Mortgage Bonds, due 2361..		$11,000 00
Gebhard Fund:		
West Shore Railroad Co.'s Guaranteed 4 per cent. First Mortgage Bonds, due 2361..		$20,000 00
William P. Trowbridge Fellowship Fund:		
Lehigh and Hudson River Railroad Co.'s First Mortgage 6 per cent. (reduced to 5 per cent.) Gold Bonds, due July 1, 1911....................		$10,231 94

Henry C. Bunner Fund:		
Cash		$1,000 00
Joseph Mosenthal Fellowship Fund:		
Cash		$7,500 00
Charles B. Beck Fund:		
Cash		$2,500 00
Schiff Fellowship Fund:		
Cash		$15,000 00
Clark Scholarship Fund:		
Seventeen Shares United New Jersey Railroad and Canal Co.'s Stock, of $100 each, at $227\frac{15}{16}$, including commission.	$3,874 94	
Bond and Mortgage to the College, on property No. 333 West Thirty-first Street, New York City, at 5 per cent., due March 1, 1899	10,000 00	
Cash	125 06	
		$14,000 00
Harsen Prize Fund:		
Twenty-eight Shares of United New Jersey Railroad and Canal Co.'s Stock, of $100 each, at $227\frac{15}{16}$, including commission	$6,382 25	
Bond and Mortgage on property on north side One Hundred and Twenty-ninth Street, 315 feet east of Fourth Avenue, at 5 per cent	23,000 00	
Cash	1,731 85	
		$31,114 10

J. M. Smith Prize Fund:		
Eleven Shares of the United New Jersey Railroad and Canal Co.'s Stock, of $100 each, at 229¾, including commission................		$2,527 25
Stevens Prize Fund:		
Nine Shares of the United New Jersey Railroad and Canal Co.'s Stock, of $100 each, at $227\frac{15}{16}$, including commission.		$2,051 44
Sloane Maternity Hospital Fund:		
Michigan Central Railroad Co.'s (Detroit and Bay City) First Mortgage 5 per cent. Bonds, due March 1, 1931.........	$125,000 00	
Chicago and Northwestern Railroad Co.'s 5 per cent. Sinking Fund Debenture Bonds, due May 1, 1933..............	125,000 00	
		$250,000 00
Vanderbilt Clinic Endowment Fund:		
Michigan Central Railroad Co.'s (Detroit and Bay City) First Mortgage 5 per cent. Bonds....................	$100,000 00	
Chicago and Northwestern Railroad Co.'s 4 per cent. Extension Bonds..............	10,000 00	
Canada Southern Railroad Co.'s Second Mortgage 5 per cent. Bonds....................	5,000 00	
		$115,000 00

JOHN McL. NASH,

Treasurer of Columbia College.

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